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THE ADVANTAGES OF NITROUS OXIDE-OXYGEN NARCOSIS, ESPECIALLY IN CONNECTION WITH THE NEW ERA IN SURGERY.*

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NEW YORK.

The bête noir of every surgical operation is the anesthetic. This view is shared alike by the surgeon, the medical man and the layman. I have never discussed the subject with a single physician who did not state frankly that if he were compelled to submit to the influence of the knife he would dread the effects of the anesthetic more than that of the operation itself.

Diagnostic and operative technic have been so nearly perfected in these latter days that the modern surgeon is able to give the prognosis almost to a certainty, barring the effects of the anesthetic alone. Little wonder is it, then, in this day of accuracy and refinement of procedure that the subject of anesthesia is receiving more attention than that of any other in the whole realm of surgery.

A few decades ago it was no uncommon occurrence to have a death upon the operating table due to the immediate effects of the anesthetic, distressing as such instances always are. The effect was so rapid and the determining factor so evident that the mortality of the anesthetic was then considered to be very easily and accurately determined. But as the science of the administration of anesthetics was evolved this evident and immediate mortality was so greatly reduced that the surgeon, having the services of a skilled anesthetist, considered that the danger of the anesthetic was practically eliminated. But, like Banquo's ghost, the bugaboo of the anesthetic would not down, and no sooner was the surgeon resting calm and serene in the contemplation of the safety of this feature of his operative work when along comes the laboratory man, delving into the heretofore hidden secrets, who shows conclusively that quite a percentage of surgical mortality, previously attributed to other causes, is due directly and solely to the effects of the anesthetic, no matter how skilfully it may have been administered.

The use of nitrous-oxide as a preliminary to ether, and the light and unsatisfactory anesthesia that is produced when "gas" is combined with air is so well understood in this city that it makes many surgeons hesitate to believe that nitrous oxide-oxygen can be used saisfactorily in major surgery. But its practically routine use in such work in some of the largest hospitals of this country, and the numerous demonstrations which I have made with it in the various hospitals and sanitariums in this city, ought to convince the most skeptical that it not only is a practical anesthetic for general and special surgical purposes, but that it also is the anesthetic *par excellence* in that large variety and number of cases and conditions in which it is especially indicated, or in other words, where ether and chloroform, either through recent research or long established usage, are contraindicated.

In comparing in this paper the advantages of one anesthetic agent to those of another, I wish to do so upon the basis of their constant physiological actions, separate and apart from the effect upon the sensory nervous system.

It is so well known that ether is an irritant to the mucous membrane of the respiratory and genito-urinary tracts that I hesitate to state such an old observation, and allow me to repeat, for the sake of emphasis, that this is a definite and constant physiological effect, regardless of the skill exemplified in its administration. Although this is an old observation, yet the majority of surgeons to-day are using ether as the anesthetic agent even though one or both of these tracts are the seat of irritation or inflammation, thus adding fuel to the flame. In all seriousness I ask, why not, in such cases, give your patient the benefit of science, instead of prejudice? Nitrous oxide-oxygen is absolutely unirritating to the respiratory and genito-urinary tracts, and should be the anesthetic agent whenever either tract is irritated or inflamed, no matter what the operation may be. Post-operative pneumonia, due to the effects of nitrous oxide-oxygen either directly or indirectly, is unknown. In fact, so completely unirritating is this anesthetic to the lungs that even so violent an inflammation as acute pneumonia is not aggravated by its prolonged administration. This remarkable freedom from post-operative lung complication is due to the fact that this anesthetic

* Read before the Manhattan Medical Society, Feb. 24, 1911.

is non-irritant and non-depressant, and does not weaken the natural defenses against bacterial attack.

There is much less shock and depression with nitrous oxide-oxygen than with ether or chloroform. The patient regains consciousness within a minute or two after the anesthetic is withdrawn, and, being always less depressed, must consequently recover from the effects of the operation sooner and better in every case than when more depressing anesthetic agents are used. Moreover, nitrous oxide-oxygen causes much less nausea and vomiting than ether, consequently the patient is much more comfortable after this form of anesthesia. Few physicians realize how much importance the patient attaches to the post-anesthetic discomfort and depression of ether, or how much he appreciates its prevention through the use of a pleasant narcotizing agent, such as nitrous oxide-oxygen.

In diabetes, nitrous oxide-oxygen is always strongly indicated, regardless of the character or length of the operation. The vastly superior results in this condition as regards the ultimate safety of the patient are undoubtedly due to the combined non-irritating, non-depressing, shock-preventing, immunity-preserving qualities of this anesthetic.

Nitrous oxide-oxygen is much less toxic *per se* than ether or chloroform, is much more rapidly eliminated from the system, and causes no degeneration, either through its early or remote effects, of the cells of the blood, liver or kidneys, as do the other anesthetics.

It has been shown conclusively in the laboratory that chloroform and ether markedly impair phagocytosis and produce anemia, thereby impeding Nature's effort to repel bacterial invasion and to repair injured tissue. And allow me to repeat, this is a definite and constant effect, no matter how carefully the anesthetic is administered, for sufficient quantity of either narcotic circulating through the blood to produce anesthesia will destroy hemoglobin, reduce the volume of the blood, materially alter the constituents of the cells through their fat solvent action and greatly reduce the functional activity of the phagocytes.

Nitrous oxide-oxygen, on the other hand, does not impair phagocytic action, and therefore does not lower the patient's natural resisting power against infection. Would you not criticize one of your colleagues if, in a case of opium poisoning, he were to administer, for any reason whatsoever, more opiates? Most certainly you would. Yet the situation seems exactly parallel where a patient with infection is operated and chloroform or ether is used as the anesthetic. Both of these agents lower the patient's natural resisting powers against infection in a definite and demonstrable manner, and consequently increase the very toxemia from which the patient is already suffering. This effect, remember, is as constant as that upon the sensory nervous system, and no care or skill in administration can prevent it. The most that has ever been accomplished even experimentally in the administration of chloroform and ether is to restore phagocytosis *after it has been impaired.* In short, chloroform and ether exert such a profound and decidedly detrimental influence on the natural defenses against infection that they suspend conferred immunity, and a subject, narcotized with either of these agents, becomes susceptible and will succumb to the specific microbe against which there was previously complete immunity.

Nitrous oxide-oxygen, on the other hand, conserves the patient's vital energy and immunity and so permits his physiologic agencies to continue waging battle for the preservation of life without depression, alteration or hindrance. Again, I ask the question, why not, in all cases of infection, give your patient the benefit of science, instead of prejudice? It is certainly time for the profession to make practical application of the demonstrations of the laboratory in this branch of work, and so render prolonged anesthesia ultimately safer, and post-narcotic effects less disagreeable in every particular. The surgical patient's interest demands that all his physiologic agencies, at this critical time, shall be maintained at the highest possible degree of efficiency, so that Nature may continue the struggle for the conservation of life without a needless handicap.

Listen to R. T. Morris*, who has caught the inspiration:

"It seems to me that the object lesson of the results of conserving the patient's natural resistance has opened the vista of a new epoch in surgery. Our faces are now turned toward Metschnikoff and Wright with their descriptions of phagocytes and opsonins, and of the natural protective forces of the patient. We are to conserve the natural resistance of the patient and to turn him over to his phagocytes and antibodies as helpfully as we can. This is the new principle—turning the tide of battle only, and leaving the patient with his physiology as nearly intact as possible. It is quite as important for the patient to retain his natural resistance after operation as it is for the surgeon to add artificial means for securing asepsis during operation.

* Extracts from *The Fourth Era in Surgery.*

"The first stage of surgery was heroic, the second was anatomic, the third was pathologic, and we are now about to enter upon the fourth or physiologic stage of surgery. Immunity is to be the watchword of the day. Behold the dawn of the fourth era of surgery lighting up the horizon!"

In the whole realm of materia medica no other anesthetic so satisfactorily and completely fulfills the requirements of this era as does nitrous oxide-oxygen; and in that most crucial of all tests, practical results, it stands without a peer, supported by science as producing the least detrimental effects of all anesthetics, and endorsed by our greatest Medical Association as being the best means for producing general anesthesia yet devised.

BRETTON HALL, 86TH STREET AND BROADWAY.

SURGICAL FORMULARY, EQUIPMENT, METHOD OF PREPARATION AND STERILIZATION EMPLOYED AT MOUNT SINAI HOSPITAL, NEW YORK.

COMPILED BY

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ASSOCIATE SURGEON.

NEW YORK.

INTRODUCTION.

We are asked so frequently by visitors to our hospital for the formulæ, etc., used in the preparation and sterilization of operating-room and ward accessories, that the publication of these methods in a convenient and available form seems advisable. The methods described have been adopted after a trial extending over many years. We do not regard them in any sense as final; in fact, we invite criticism and any suggestions will be accepted with gratitude.

CATGUT.

General Directions.

All catgut is wound in a single layer, fastened on both ends, on so-called Elsberg spools,* (Fig. 1) (obtainable at Henry Allen's, 138 William street, New York City). For the sake of ready recognition, the different sizes of catgut are wound on different sized spools.

Prior to being used, cultures are made from every lot of catgut prepared.

PLAIN CATGUT.

(See General Directions.)

Sizes 0 and 1.

1. Place for 24 hours in commercial ether.
2. Place for 13 days in 1 to 500 alcoholic bichloride of mercury solution.
3. Remove with sterile forceps and preserve in 95% alcohol until used.

(Note—Prior to using allow the catgut to remain in the alcohol for at least two weeks.)

Sizes 2 and 3.

1. Place for 24 hours in commercial ether.
2. Place for 16 days in 1 to 500 alcoholic bichloride of mercury solution.
3. Remove with sterile forceps and preserve in 95% alcohol until used.

(Note—Prior to using, allow the catgut to remain in the alcohol for at least two weeks.)

CHROMICIZED CATGUT.

(See General Directions.)

Sizes 0 and 1.

1. Place for 24 hours in 95% alcohol.
2. Allow to dry by spreading on a sterile towel.
3. Place for 30 hours in the following chromicizing solution:

℞ Potassium Bichromate	5.0
Carbolic Acid	125.0
Distilled Water	2500.0

4. Remove with sterile forceps, and allow to dry slightly by spreading on a sterile towel.
5. Place for six days in 1 to 500 alcoholic bichloride of mercury solution.
6. Remove with sterile forceps and preserve in 95% alcohol.

Sizes 2 and 3.

1. Place for 24 hours in 95% alcohol.
2. Allow to dry by spreading on a sterile towel.
3. Place for three days in the chromicizing solution. (Formula given above.)
4. Remove with sterile forceps and allow to dry slightly by spreading on a sterile towel.
5. Place for six days in 1 to 500 alcoholic bichloride of mercury solution.
6. Remove with sterile forceps and preserve in 95% alcohol.

IODINE CATGUT.

Moschcowitz (*Annals of Surgery*, January, 1911.)

(See General Directions.)

1. Place for five days in the following solution:

Iodine Crystals	50.0
Alcohol 95%	1000.0

(Shake frequently until dissolved.)

2. Remove with sterile forceps, and allow to dry by spreading on a sterile towel, covered by a sterile towel.
3. Preserve dry in a sterile glass vessel.

SILK.

Sizes 1 to 3.

* *International Clinics*, Vol. I., Series XI.

1. Wind loosely on spools; not necessarily in a single layer.
2. Boil for ten minutes in plain water.
. Preserve in 95% alcohol.

All Other Sizes.

1. Wind loosely on spools; not necessarily in a single layer.
2. Boil for fifteen minutes in plain water.
3. Preserve in 95% alcohol.

Linen Thread.

Pagenstecher's Celluloid Thread.

1. Roll on spools, not necessarily in a single layer.
2. Boil for fifteen minutes in plain water.
3. Preserve in 95% alcohol.

Silkworm-Gut.

1. Roll into suitable coils.
2. Boil for fifteen minutes in plain water.
3. Preserve in 95% alcohol.

Rubber (Gutta-Percha) Tissue.

1. Cut into pieces of the desired size.
2. Scrub both sides with tincture of green soap and water.
3. Rinse off under running water.
4. Place for 48 hours in 1 to 500 aqueous bichloride of mercury solution.
5. Wipe off each piece, cover with a piece of sterile gauze of same size as rubber tissue; roll loosely and preserve dry in a sterile glass jar.

(Note—For the final step, the supervising nurse prepares herself as for an operation.)

Gauze, Sponges, Compresses, Packings, Dressing Materials, Towels, Sheets, Gowns, Etc., are sterilized in Schimmelbusch drums in steam sterilizer for one-half hour under a pressure of 15 to 17 pounds. A further fifteen minutes is allowed for drying.

Iodoform Gauze.

The nurse preparing this, as well as Peru Balsam, Thiersch's and Bismuth gauze, scrubs up as for an operation; puts on a sterile gown and sterile gloves, and uses for all subsequent manipulations sterile utensils only.

The following formula calls for 36 yards of gauze:

1. Wash the gauze in 1 to 500 aqueous bichloride of mercury solution and squeeze very dry.
2. Soak and manipulate the gauze three successive times in the following mixture:

Powdered Iodoform	℥ii
Glycerin	℥ii
Sterile Water	Oiv

3. Squeeze dry, fold into proper lengths, and wrap in plain gauze and finally in a heavy muslin wrapper.
4. Sterilize in the autoclave for 15 minutes at a pressure of 7 lbs.

(Note—For use in the wards similar gauzes cut into strips one to two inches wide are loosely packed into large test tubes, stoppered with cotton and sterilized as above.)

Iodoform Gauze (Formula of Dr. J. Brettauer).

Iodoform Powder	2.5
Ether	240.0

Six yards of sterile gauze are soaked and manipulated in the above solution; the gauze is then slightly dried by shaking. It is now placed in an amber-colored jar, the top screwed on, and the whole sterilized in an autoclave for 15 minutes at 7 lbs. pressure.

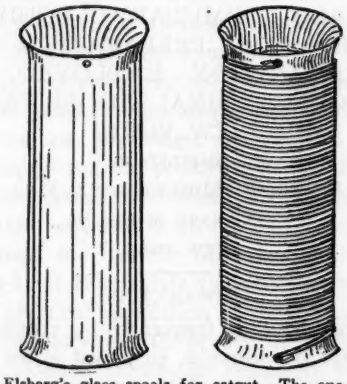

Fig. 1. Elsberg's glass spools for catgut. The one to the right is wound with catgut, the other is without catgut. (Two-thirds natural size.)

Peruvian Balsam Gauze.

All steps are the same as for preparing iodoform gauze, except that 18 yards of gauze and the following mixture are used:

Peruvian Balsam	℥xx
Castor Oil	℥viii

The final sterilization takes place in the autoclave for 30 minutes at 15 lbs.

Thiersch's Gauze.

All steps are the same as for preparing iodoform gauze, except that 18 yards of gauze and the following solution are used:

Thiersch's Sol.	℥xxxvi
Glycerine	℥i

The final sterilization takes place in the autoclave for 30 minutes at 15 lbs.

Bismuth Gauze.

(Dr. S. Wiener, *Journal of the American Medical Association*, October 23, 1909.)

All steps the same as for preparing iodoform gauze except that the following mixture is substituted:

Bismuth Subnitrate	ʒiv
Glycerin	ʒii
Sterile Water	Oiv

The final sterilization takes place in the autoclave for 30 minutes at 15 lbs.

HAND BRUSHES.

Cleanse with soap and water; pack loosely in drums, and sterilize in the autoclave for 30 minutes at 15 lbs.

TALCUM POWDER.

Place in tin sugar shakers, wrap in heavy muslin cover and sterilize in the autoclave for 30 minutes at 15 lbs.

(Note—To prevent caking, remove the talcum powder at once from the autoclave.)

GLOVES.

1. Wash with cold water to wash away blood, pus, etc.
2. Wash with hot water.
3. Dry in a warm place (we use our blanket heaters) spread out flat.
4. Turn inside out, and dry again.
5. Examine for holes and repair these in the following manner: Clean the area to be patched with benzine, and stick on a rubber patch with india rubber cement (Goodyear India Rubber Glove Mfg. Co., 503-5 Broadway, New York City).
6. Powder with talcum powder inside and outside. Turn tops back for about two inches. Mate and fold into heavy muslin covers, made for that purpose. Finally seven pairs of gloves are folded into one outside muslin cover.
7. Sterilize in the following manner: Start autoclave and wait until a pressure of 15 lbs. is reached. Put in the glove and sterilize for 15 minutes at 15 lbs. Let the steam escape and take the gloves out immediately.

SEA SPONGES.

(Used only very exceptionally.)

1. Beat the sponges to remove all sand and foreign material.
2. Place for 12 hours in a 33% solution of crude hydrochloric acid in water.
3. Wash several times in running water to remove all acid.
4. Soak for 24 hours in a 5% aqueous solution of green soap.
5. Wash several times in running water to remove all alkali.
6. Place for at least 48 hours in, and preserve in a 5% aqueous solution of carbolic acid.

NORMAL SALT SOLUTION.

(0.9% Na Cl.)

The solution is filtered into Florence flasks, half full, through a Berkefeld filter (See Fig. 2). The stone of the Berkefeld filter is cleaned daily by boiling in water.

The flasks are then stoppered by a cotton plug surrounded by parchment paper. The parchment paper is so folded as to completely cover the top of the flask. The top of the flask is further protected by several turns of a muslin bandage.

The final sterilization takes place in the autoclave for one and a half hours, at 15-18 lbs.

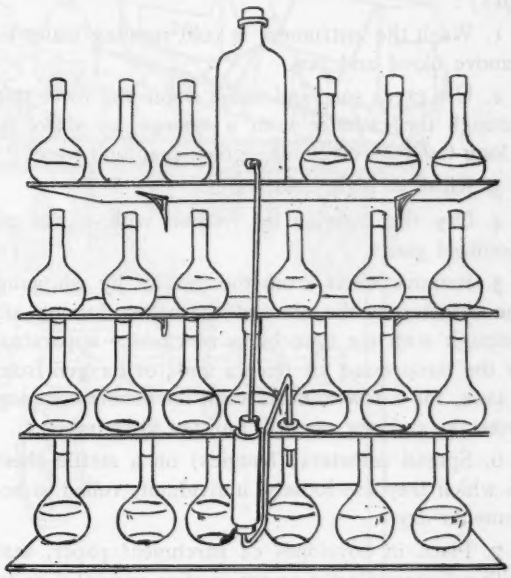

Fig. 2

Fig. 2. Filtering saline solution into flasks.

LUBRICANT FOR CATHETERS, SOUNDS, ALL RECTAL AND VAGINAL EXAMINATIONS, ETC. (HAGUE).

Irish Moss	ʒi
Gelatine	ʒi
Water	Oii

Let the first two ingredients macerate over night in the water. Then heat the mixture, and while warm strain by squeezing through a triple layer of bleached gauze. Preserve by adding oxycyanide of mercury in the proportion of 1 to 6000. Fill into collapsible tin tubes.

URETHRAL CATHETERS, BOUGIES, SILK-WOVEN CATHETERS

are sterilized in the following manner:

They are first thoroughly washed off with warm soapsuds; the latter is also forced through the lumen with a syringe. They are then soaked for 15 minutes in an aqueous solution of bichloride of mercury 1 to 500. They are next dried—on the

surface with a towel; inside by forcing air through with a syringe. They are preserved in a vertical position in glass jars, which have formalin in the bottom.

(Note—Prior to being used, the formalin is washed off with sterile water.)

During the past year, particularly in the wards, where it is difficult to keep these instruments for any length of time in a sterile manner, we have used the following method devised by Dr. M. W. Ware (*American Journal of Surgery*, Vol. XXV., p. 156, 1911):

1. Wash the instrument in cold running water to remove blood and pus.

2. Use green soap and *warm* water and force this through the catheter with a syringe, or shake in a long test tube containing green soap and water.

3. Rinse in plain cold water.

4. Dry the exterior by friction with a pad of sterilized gauze.

5. Remove water from the interior by whipping the catheter in the air and thereafter forcing air through with the twin bulbs of cautery apparatus, or the compressed air from a tank, or oxygen from a tank, for a few minutes until no bubble escaping from the catheter eye will moisten filter paper.

6. Spread catheters (bougies) on a sterile sheet in which they are loosely, individually rolled to become air dry.

7. Place in envelopes of parchment paper, seal with adhesive plaster or paper clips and label as to size and shape.

8. Sterilization in steam chest by process of Tyndalization—two exposures of 30 minutes within 24 hours.

9. For use, tear off envelope at outer end of catheter.

10. Catheters thus prepared placed in bouillon show no growth.

CYSTOSCOPES.*

After using cystoscopes are

(1) Washed inside and out with plain water.

(2) Then washed inside and out with green soap and water, cotton-wound applications being used for cleansing the lumina.

(3) Cleansed with alcohol and dried.

(4) Put away in their boxes. Instruments that have been used on tuberculous or otherwise infected bladders or on syphilitic subjects are suspended in formalin vapor for 24 hours after drying.

* Other electrically-lighted examining instruments are similarly prepared. Sigmoidoscope and endoscope tubes and obturators not bearing lamps or lenses are "boiled."

Before Using. Method I.—Wipe or rinse off all parts with pure phenol, followed by alcohol.

Method II.—Immerse all parts for 20 minutes in an upright jar of 5% phenol solution. (a) Dry parts with sterile towel, or (b) use direct from phenol solution without drying.

In addition to these formulæ, it seems worth while to describe certain of our outfits and acces-

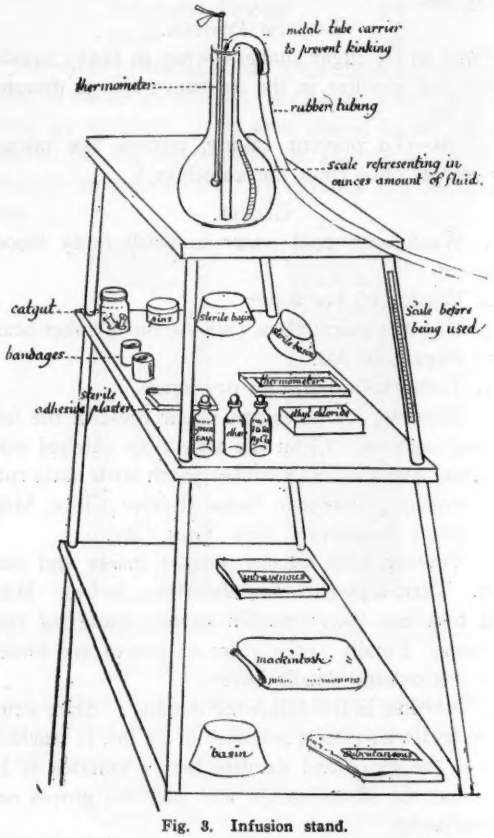

Fig. 3. Infusion stand.

sories, which have proven not only advantageous, but occasionally of so great a value as to be dignified by the term "life-saving." They are usually of such a nature that constant readiness is a *sine qua non*.

THE INFUSION STAND.

As shown by the accompanying illustration (Fig. 3) this consists of a metal stand with three shelves. The upper shelf, 57 inches from the floor, is sufficiently high to give the requisite syphonage and pressure. The flasks of sterile solution are always kept warm and in readiness in our blanket heater. One of these outfits is kept in readiness in every ward, so that either a subcutaneous or intravenous infusion can be given at a moment's notice. The infusion stand is revised once a week. The accom-

panying diagram and list are self-explanatory:

First Shelf:

Flask of normal salt solution.

Second Shelf:

Tr. green soap, 1 bottle.
Ether and alcohol, 1 bottle.
Bichloride solution, 1 bottle.
Jar containing catgut.

Tubing carrier.
Canula with wire, tubing and connecting tip.
2 pairs artery forceps.
1 pair anatomical forceps.
1 pair mouse-tooth forceps.
1 pair straight scissors.
1 pair curved scissors.
Scalpel covered with cotton.

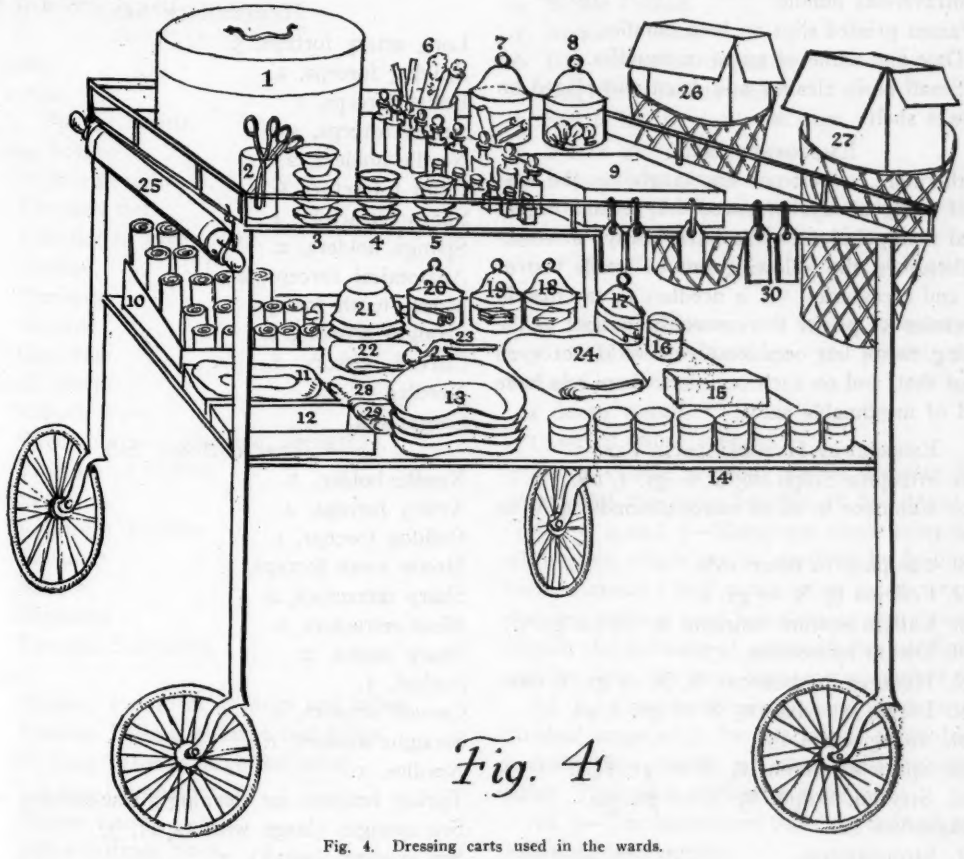

Fig. 4

Fig. 4. Dressing carts used in the wards.

Sterile thermometer.
Sterile round basin with 3 sterile glasses.
Four sterile sponges.
Safety pins.
Two 2-inch bandages.

Third Shelf:

Round basin for bichloride solution.
Rubber sheet.
Ethyl chloride spray.
Sterile adhesive plaster strips in envelope.

Intravenous Bundle:

3 sterile towels.
1 gauze dressing.
4 gauze sponges.
1 glass syringe.

Subcutaneous Bundle:

1 sterile towel.
1 gauze dressing.
1 glass syringe.
1 pair artery forceps.
Tubing with carrier.
2 aspirating needles with wires, tubing and connecting tip.

To Sterilize Infusion Sets:

1. Place thermometer and 3 glasses in bichloride solution, 1-500.
2. Boil instruments, syringe, tubing, straight pins, basin.
3. Have sterile towels, scrub-up sponges, gauze sponges, 1 cotton sponge and gauze for dressing.

4. Nurse must then scrub up and remain surgically clean, during the entire doing up of the bundle.
5. Arrange thermometer diagonally in towel and fold neatly.
6. Place glasses and sponges in sterile basin and do up in towel.
7. Subcutaneous bundle.
8. Intravenous bundle.
9. Fasten printed slips on both bundles.
10. Date and name of nurse on bundles.
11. Small basin cleaned and dried and placed on lower shelf.

Emergency Sets.

Furthermore, experience has taught us the wisdom of being always prepared for certain urgent surgical manipulations. We have always in readiness, therefore, the following sets of sterile instruments and accessories. It is needless to say that in emergencies we prefer to remove the patient to the operating room, but occasionally there is not even time for that, and on such occasions these sets have proved of inestimable value.

Emergency Hypodermatic Tray.

1. Sol. Atropine Sulph. ♏ X = gr. 1/100.
2. Sol. Camphor in oil of sweet almonds ♏ V = gr. i.
3. Sol. Camphor in ether 10%.
4. Sol. Codeine ♏ X = gr. i.
5. Sol. Caffein sodium benzoate ♏ IV = gr. i.
6. Sol. Cocain hydrochlor. 1%.
7. Sol. Hyoscyn. hydrobrom. ♏ X = gr. 1/100.
8. Sol. Eserin salicylate ♏ X = gr. 1/40.
9. Sol. Nitroglycerin 1%.
10. Sol. Sparteine Sulph. ♏ X = gr. ½.
11. Sol. Strychn. Sulph. ♏ X = gr. ½.
12. Magendies Sol.
13. Tr. Strophanthus.
14. Fl. Ext. Digitalis.
15. Digalen.
16. Adrenalin.
17. Whiskey.
18. 2 sterile "Sub Q." syringes.
19. Several sterile needles.
20. Sterile sponges in alcohol.

(All of above are kept in 1 oz. glass-stoppered, wide-mouth vials.)

Emergency Bundle.

(Sterilized Completely.)

Draw sheets, 2.
Short-sleeved coats, 2.
Towels, 1 doz.
Large gauze rolls, 2 packages.
Large gauze flats, 2 packages.
Wide gauze packing, 1 package.
Iodoform gauze, 1 package.
Sterile cotton.
Gauze sponges, 1 bag.
Muslin bandages, 4.
Hand sponges, 1 package.
Very small packing, 1 package.

Hemorrhage Set.

Long artery forceps, 3.
Bulldog forceps, 2.
Bullet forceps, 1.
Artery forceps, 4.
Needle holders, 2.
Blunt retractors, 6.
Sharp retractors, 4.
Sponge holders, 2.
Anatomical forceps, 2.
Mouse tooth forceps, 1.
Straight scissors, 2.
Curved scissors, 1.
Needles.
Catgut-silk.

Tracheotomy Set.

Needle holder, 1.
Artery forceps, 2.
Bulldog forceps, 1.
Mouse tooth forceps, 2.
Sharp retractors, 2.
Blunt retractors, 2.
Sharp hooks, 2.
Scalpel, 1.
Curved scissors, 1.
Straight scissors, 1.
Needles, 1.
Turkey feathers for cleaning a tracheotomy tube, 3.
Sea sponges (large with tape), 3.
Sea sponges (small), 3.
Tracheotomy tubes (assorted sizes), 3.
White packing (gauze), 1 package.
Split compress, 1.
Gauze Rolls, 2.
Gauze square, 2.
Oilskin bib, 1.

Obstetrical Bundle.

Draw sheets, 2.
Leggings, 1 pair.
Towels, 6.
Gauze dressing.
Cord dressing.
Tape.
Gown.
Perineal pad, 1.

Laparotomy binder, 1.
T-Binder, 1.

Dressing Carts.

Our dressing carts are a product of evolution and are being constantly improved upon. Those now in use have proved eminently satisfactory; so much so, indeed, that we have deemed it proper to include an illustration (Fig. 4) of one in this formulary. This diagram and attached list, with occasional footnotes is self-explanatory.

Articles on Cart.

1. Drum.
2. Forceps.
3, 4, 5. Sponge basins.
   Large bottles:
      Bichloride solution, 1 to 500.
      Thiersch Sol.
      Tincture of green soap.
      Alcohol.
      Peroxide.
      Benzine.
      Glycerine.
   Small bottles:
      Balsam Peru.
      Silver Nitrate (assorted strengths).
      Tincture of Iodine.
   Shakers:
      Iodoform Powder.
      Talcum.
      Aristol.
      Dermatol.
      Bismuth Subiodide.
6. Jars:
      Packing Iodoform in large test tubes.
      Packing Balsam in large test tubes.
      Packing Plain in large test tubes.
      Tongue Depressors.
      Plaster knife.
      Silver Nitrate Stick.
      Sterile wood applicators in large test tube.
7. Wet dressings.
8. Wet or dry sponges.
9. Instruments.
10. Bandages of assorted sizes.
11. Rubber tubing.
12. Instrument tray.
13. Pus basins.
14. Jars:
      Zinc Oxide Ointment.
      Boric Acid Ointment.
      Lassar's Paste.
      Vaseline.
      Scarlet Red Ointment.
      Ichthyol Ointment.
15. Ethyl Chloride Spray.
16. Sterile Vaseline.
17. Iodoform Gauze (large pieces).
18. Square Compresses.
19. Split Compresses.
20. Sterile Rubber Tissue.
21. Scrub-up Basins.
22. Adhesive Plaster, sterile.
23. Atomizer—carbolic, 5%.
24. Sterile Cotton.
25. Rubber Tissue,
26. Bag for soiled dressings.
27. Bag for soiled towels.
28. Sterile lint in sterile package.
29. Sterile gloves in package.
30. Laparotomy straps.
31. Adhesive plaster on roller—various widths.

Ad. 1—The contents of a surgical drum are:

60 "Flats." Gauze 1 yd. square, properly folded flat.

40 "Rolls." Gauze 1 yd. square, properly rolled.

30 "Fluffs." Gauze ½ yd. square, properly fluffed (loose).

4 dozen towels.

1 bag of gauze sponges.

Ad. 2—These are long sterile dressing forceps, with which the nurse handles all dressings.

Ad. 3, 4 and 5—These are small enamel basins with cover, which can be sterilized by boiling; each basin contains a half dozen moist gauze sponges, so that one basin is used for dressing one patient only. Should the contents of one basin be insufficient for one dressing, the little basin is replenished from 8.

Ad. 7—Considerable latitude is given to the individual surgeons in the selection of these dressings. Usually they consist of small rolls moistened in either Thiersch's or Burow's solution.

Ad. 9—The instrument trays are stocked with the following instruments:

6 curved scissors.
3 straight scissors.
6 anatomic forceps.
6 mouse tooth forceps.
2 artery forceps.
2 large copper probes 14".
2 small silver probes.
4 metal applicators.
1 grooved director.
1 sharp spoon.
2 rubber catheters.
1 glass piston syringe.
2 medicine droppers.
1 glass irrigating tip with tubing.
2 treatment glasses.

Wooden tongue depressors.
Safety pins.

Ad. 11—Sterile rubber drainage tubing of assorted sizes.

Ad. 12—Basin for collecting the used and infected instruments.

Ad. 26 and 27—Wire baskets containing large heavy paper bags, which when full are removed and can be burned.

ROUNDS BASKET.

The attending physicians and surgeons have derived considerable time-saving advantage by the nurse carrying everything that may be required in a so-called "rounds basket," which is stocked as follows:

Bandage scissors.
Safety pins in box.
Metal applicators.
Wooden tongue depressors.
Chapin tongue depressor.
Alcohol.
Ether.
Gauze roll.
Absorbent cotton (small quantity).
Finger cots.
Rubber gloves.
Vaseline and small saucer.
Talcum powder.
Glass slides.
Cover glasses.
Platinum loop.
Paper bag.
Sounding towel.
Hand towels.
Nasal speculum.
Ear speculum.
Blue pencil.
Head mirror.
Laryngeal mirror.
Candle.
Matches.
Tape Measure.
Litmus paper.
Treatment glasses (2).
Medicine dropper.

In the ophthalmic and in the aural departments baskets, especially adapted to the respective needs of eye and ear cases, are employed.

Slender objects entering the sole are usually driven upwards and backwards. In the heel there are no muscle bellies to move them and it is unlikely that the impact of walking much disturbs the primary focus.

SURGICAL ESSENTIALS.

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STERILE WASH AND WOUND DRESSINGS.

It is scarcely more than 25 years that the *antiseptic* methods have been displaced by the *aseptic* treatment of wounds. Chemical solutions of sufficient strength to destroy bacteria and even to inhibit their growth, in a healing wound become, at the same time, a serious menace to cell-development and proliferation and interfere vitally with normal tissue repair. It was the full realization of this that gradually led to the modern conception of aseptic surgery, and, in place of wound dressings saturated with powerful germicides, there was introduced everywhere, dry, unimpregnated gauze sterilized by means of *thermic* instead of *chemical* methods.

The simplest of these is that by boiling, but in the case of operating-room wash and wound-dressings where the material should be *dry after sterilization,* other methods had to be adopted. *In the most practical and reliable of these the materials are subjected to the sterilizing action of steam under pressure.* Many apparatus, some of them apparently quite complex, have been designed for this purpose, but the general principles upon which their construction is based are essentially the same.

In the older models, the steam was admitted into the sterilizing space immediately, and there was no particular device which insured the proper *preliminary warning* of its contents. The result was, that the parcels became damp or wet from the condensation of the superheated steam upon the cool surface. To correct this, the mantle of newer sterilizers consists of *two* cylinders one within the other. The space *between* them can be filled with steam and is called the *steam-jacket* space in distinction to the space *within* the inner of the two cylinders—the *sterilizing space.* After the nurse has packed the sterilizing space, the door of the sterilizer is closed and the steam-jacket is filled with steam. When the parcels have been *warmed sufficiently,* superheated steam is admitted to the sterilizing space itself to take the place of the dry heated air which it contains.

When the sterilization is complete, the *residual steam* is removed from the compartment. To accomplish this a separate valve-mechanism is attached to the newer sterilizers, by means of which the residual vapor can be disposed of by *exhaustion.* The same device also makes it possible to

get rid of the warmed air at the *beginning* of the sterilization process without depending on the incoming steam to displace it. This provision effectively does away with the occasional wet bundles delivered from the older sterilizers and insures thorough dryness of the wash and dressings after sterilization.

Briefly stated, the process of sterilization by steam under pressure involves the following steps:

I. Packing of the sterilizing space.

II. Warming of the wash to prevent condensation.

III. Exhausting the air and filling the compartment with steam.

IV. Permeation of the parcels by steam under a pressure of 15 pounds to the square inch and a temperature of 250° F. (121° C.) for 30 minutes.

V. Final drying of the parcels; the desiccation taking from 10 to 20 minutes.

The total time required for the work of sterilization in preparing for an operation may vary considerably and usually exceeds an hour, but the time *consumed by the actual sterilization itself* with the thermometer registering 250° F. and the manometer indicating a pressure of 15 pounds, *should never be less than* 30 *minutes.* Practically speaking in hospital routine the contents of each parcel have been subjected to the sterilization process *twice* before they are used at an operation. It is the practice to sterilize the contents of the parcels immediately after they have been made up to be put away in the parcel closet. When needed they are resterilized, and can then be taken directly from the sterilizer for use.

One object of this double sterilization is to attack *spores,* which initially show *considerable resistance.* But liberated from the bacterial bodies and made to germinate these are more likely to be destroyed during a second sterilization. Fortunately the pathogenic organisms which most commonly produce wound infections are *cocci*-streptococci, staphylococci, pneumococci, gonococci and have no spore-forms; the bacillus pyocyaneus and colon bacillus are not spore-bearing, while the tetanus bacillus which produces spores is of infrequent occurrence.

If any articles, such as towels or gloves, are known to have been soiled with pus, for example at an unclean operation, it is always wisest and safest to attend to their sterilization promptly, by boiling them. Fifteen minutes in slightly alkaline or 25 minutes in plain water is adequate. When wanted again for operation these articles can be resterilized by steam under pressure in the usual manner, and a transference of pathogenic germs from one case to the other need not be feared. The *initial boiling* is resorted to in such cases because boiling is the simplest and most reliable of all methods of sterilization.

The greatest scruple is necessary in case of the rubber gloves because they come into the most intimate contact with the wound. A gauze drain is put into each glove so as to keep it from collapsing. As a rule alkaline solutions are more apt to destroy the elasticity of the rubber gloves than plain water, but if time is a factor, instead of using plain water, gloves *may* be boiled from 10 to 15 minutes in a 1-1000 aqueous solution of sodium hydrate (Na O H.), in fact, this may be done a number of times before their texture is materially impaired and the gloves become brittle and lose their elasticity. Ordinarily gloves are boiled in *plain* water from 20 to 25 minutes. After boiling they are at once thoroughly dried and powdered and are then ready for resterilization by steam under pressure. In making rounds through the hospitals a remarkable diversity of opinion can be gathered on this subject. There seems, however, no tenable reason why rubber gloves should not be resterilized *by steam under pressure* in the same manner as the operating-room wash and wound-dressings. Of course, during the steam sterilization, just as during sterilization by boiling, it is important that a *gauze drain be placed into each glove so that the circulating steam can have access to its interior.* Furthermore, stickiness or adhesion of the gloves is entirely obviated if the surfaces have been well powdered before they are subjected to the superheated vapor.

In substituting one method for the other the comparative time required for sufficient sterilization must be borne in mind. It is indicated in the following table:

Boil in alkaline water (104° C.) 5-10-15 minutes.
Boil in plain water (100° C.) 20-25 minutes.
Steam at 250° F. (121° C.) 35 minutes.
Steam at 212° F. (100° C.) 45 minutes.

With regard to the size of the parcels and the manner of packing the sterilizer there are a few points which are of practical importance. The sterilizer should not be packed too tightly if the steam shall circulate freely between the parcels. To further facilitate penetration the individual bundles, above all if they are somewhat compact, should not be made larger than necessary. The parcel wrappers should be of strong cloth which is adequately porous; covers of rubber or of other impermeable materials, paper bags or envelopes, are never to be used as containers for anything that is to be steril-

ized. The importance of this is not unfrequently lost sight of in the sterilization of talcum-power which finds its way into the sterilizer in receptacles of wood, glass, tin or paper. Although these receptacles may be provided with small perforations at one end, the free access of the steam is unnecessarily impeded. The result may be insufficient sterilization of the contents and the direct transference of pathogenic organisms to the wound. If the surgeon insists on having talcum sterilized separately, small quantities of it should be put into pockets or bags of cloth. However, where stress is laid on powdering the rubber gloves properly before sterilization and the surgeon takes time to dry his hands thoroughly with a sterile towel before attempting to put them on, the demand for an extra supply becomes redundant.

What should the sterilized bundles for the ordinary uncomplicated laparotomy contain? The nurse has in readiness a supply which is sufficient; firstly, for the patient; secondly, for the surgeon, assistants and nurses who help at the operation. In an interval appendicitis where only one assistant at the wound is needed besides the anesthetist, and one operating-room nurse who has charge of the instruments, suture material and gauze, the number of sterile gowns required is accordingly small. Desirable are gowns with long sleeves over the cuffs of which the rubber gloves can be drawn so that the arm is entirely covered. A very practical receptacle for the sterile gowns, which is in use in some of the operating rooms in this city, is a metal drum, the cover of which can be raised whenever a sterile gown is needed, by stepping on a pedal at the base of the stand on which it rests. As soon as the pressure with the foot is released the lid of the drum again drops back into place.

There should be seamless rubber gloves of the proper size to fit all those concerned in the operation. Their number should be ample to allow for one change for each assistant and nurse and, if occasion should demand, two for the surgeon. The asepsis can be logical only if gloves are worn throughout the entire operation and by *all* who come in contact with the sterile materials and instruments.

This means that the nurse who arranges the supply-table and consequently touches the sterile gauze, instruments and suture materials *can do this only with rubber gloves.*

The laparotomy sheet should be large enough to cover the whole patient *besides draping the operating table on each side;* it has an opening over the field of operation. A T-shaped opening in the cloth is more serviceable for the various incisions, than the longitudinal one. This is particularly apparent when a transverse incision, such as the semilunar hypogastric, is used by the surgeon.

After the laparotomy sheet is adjusted four towels surround the wound site. There should be sufficient for one renewal and an extra dozen for other needs. The surgeon asks for towels for his hands, a towel or two are wanted to dry the abdomen after the cleansing maneuvers, another wraps the heft of the Pacquelin cautery.

Where one nurse is able to take charge of the instruments and sterile gauze there is no advantage in covering more than one supply table. Sterile gauze and towels, suture material, needles and needle-holder, Michel's clamps, retractors, forceps, clamps and hemostatics, and cutting instruments can all be placed on one long, narrow table in orderly fashion and kept separated from one another. When the surgeon prefers to pick the instruments himself, directly from a Hartley table which is pushed up close to the field of operation, a suitable cover or slip which fits the instrument tray can be added to the sterilizer supply. A wet instrument should always be dried before it is laid down upon the supply table. If the cover, which often consists of a single layer of cloth, is accidentally saturated by dropping a bundle of wet suture material upon it, diffusion currents are set up at once from the surface of the unsterile glass plate beneath to the suture which lies in the wet area. Such a suture is quickly soiled and must be discarded. It is safest to put all the suture materials on a small tray of agate ware which has been sterilized with the instruments for this purpose.

There need not be a great variety of sterilized gauze. The tiny gauze sponges should be eliminated since they are apt to be lost in the wound. When a very small piece of gauze is wanted it can be cut as occasion demands. *The gauze sponges* should be 2½ x 2½ inches and certainly not larger than 3 x 3 inches. The gauze should be so folded into a square that the cut edge of it nowhere shows fraying with the liberation of little threads, or unfolding does not take place while it is handled. It should be at least four-ply so that when it is folded diagonally—delta sponge—it is eight-ply. In this form it serves its purpose as a sponge most efficiently, which is chiefly to *imbibe* fluids—secretions, blood or pus. The delta sponge is picked up in such a manner that, to resort to geometrical verbiage, the blades of the long thumb forceps are *parallel to the hypothenuse* of this triangular piece of gauze. The nurse should understand this,

since she may be asked to fix sponges in the sponge holder in this way, or else, to hand them to the surgeon's forceps individually.

When more appreciable quantities of fluid have to be dealt with, as, for example, in the bursting of an abscess or cyst during operation, the gauze sponges may have to be replaced by pieces of gauze which have a greater bulk and proportionately increased imbibing power. Large pieces of gauze may also be called into play in exhausting a small transudate or exudate, or in removing accumulated blood. In the case of profuse oozing from an incision, as in operating for cancer of the breast, large pieces of gauze packed into the bleeding furrow effect prompt hemostasis and prevent undue loss of blood. In a sudden venous hemorrhage from the depth of the abdomen or pelvis where the injured vessel is not at once manifest, firm tamponade with large pieces of gauze is the emergency measure. Rarely, and in modern surgery only when this cannot be circumvented, a large piece of gauze may be inserted into the abdomen or pelvis to "act as a drain"—really a foreign body around which adhesions of the intestinal loops rapidly form on account of the destruction of the surface endothelium, so that when the gauze is removed in the course of five to seven days a securely walled-off canal or conduit remains, which leads down to the suspected focus. For *all* these exigencies larger pieces of gauze folded into four-ply tampons 4 x 16 inches and gathered into accordeon pleats—accordeon gauze—can be fitly employed.

Besides gauze sponges and tampons, there are required in the ordinary laparotomy about a dozen *abdominal pads.* These are intended only for walling-off the intestines, or for protecting the viscera from traumatism or contamination. The abdominal pad also is made of surgeon's gauze which is, however, *sewn* into a square 12 x 12 inches with a tail of cord or tape 2 inches long and a metal ring attached to one of the corners. It is not intended to absorb secretions and should not be bulky nor have a thick edge, and therefore consists of only *three* layers of gauze. The *capillarity* of the gauze and the friction make it a little difficult to introduce such a pad, but after it is finally placed in situ it has the decided advantage that it is not as readily dislodged by the abdominal breathing, intestinal peristalsis, and the surgeon's manipulations as a pad made of some smooth material would be. To facilitate the placing of an abdominal pad the assistant should hold it up suspended by the ring, while the surgeon grasps the most dependent corner with the long thumb forceps in his right hand, holding the intestinal coils or viscus in question out of the way with the left.

Although it is not imperative, it is practicable to have both the materials for cleansing the area of operation and those used for the final dressing of the wound put up in separate parcels. For the scrubbing manipulations the assistant wears sterile rubber gloves, and the territory immediately surrounding is covered with sterile towels. In scouring the abdomen the piece of gauze used should be large enough to fill the hand—a square yard of gauze well crimped, yields about the requisite bulk to make its handling convenient. Small bits of gauze or cotton held between a few fingers cannot be considered in earnest attempts to render a large surface clean. For the application of alcohol and the subsequent drying, two smaller pieces of gauze each about half a yard square will do. In all, no less than four pieces of crimped gauze—two large and two smaller ones—should constitute the content of this parcel.

The use of aseptic gauze in place of the antiseptic, for wound dressings, simple and plausible as it may seem, is nevertheless the outcome of a complicated evolution. This demonstrates again what has been the case with many of the fundamental conceptions in the practice of surgery, which at the present time, after their unencumbered exposition by our teachers, appear almost self-evident.

For wound dressing, *aseptic gauze,* dry and *porous,* is the best material. Indeed, many clean wounds would not have to be dressed at all were it not for fear of an injury to the delicate suture-line, or the risk of contamination from without before it has had time to become *naturally sealed* by the healing process. Even after the most painstaking apposition occasionally there may be *slight oozing* from the line of the incision, but the gauze dressing serves to take up the secretion at once and keeps the wound dry while at the same time it admits of sufficient ventilation to keep the covered skin in a healthful state. To secure the maximum aeration the piece of gauze which is in direct contact with the wound should always be a crimped piece. Four to eight such pieces, each half a yard square, may be applied, depending on the case. The bulkier dressings are sometimes used as elastic pads to prevent the accumulation of serum or blood where this is anticipated. A square of uncrimped gauze or a folded towel may be chosen as a cover, but never impermeable material such as rubber tissue, except where there is a special indication as when there is danger of soiling the dressing from without by dejecta or urine. It can be readily il-

lustrated in the laboratory how *the mere drying process* inhibits the development of a colony of bacteria. That warmth and moisture on the other hand are vital to bacterial growth is a surgical platitude. Normally an invisible evaporation takes place from the dressing and the surface is thereby cooled. An enclosure, impermeable to moisture, causes the atmosphere in the dressing to stagnate and the secretions to decompose and provides the conditions necessary for the rapid incubation of germ-life.

This analysis of the sterile wash and gauze needed at an operation is given in considerable detail in order to facilitate a clear understanding in this matter, between the surgeon and the nurse. Precision in such things as these, is the basis of a reliable operating-room service.

The nurse's list of supplies for one laparotomy:

3-6 head covers and gowns for doctors and nurses.

7-9 pairs of rubber gloves and 2-4 pairs of half-gloves.

1 laparotomy sheet.

2 dozen towels.

2 covers for the supply table.

½ gross of gauze sponges.

2 dozen gauze tampons.

1 dozen abdominal pads.

1 parcel scrubbing gauze.

1 parcel dressing gauze.

To a certain degree the operating room nurse may exercise her natural inventiveness in the get-up of this stock of supplies for an operation, but she should never allow *variety in design* to impair the *utility* of an innovation; in general, in the pursuit of asepsis it is not complexity and multiplicity, but *simplicity and uniformity that are most desirable.*

1041 MADISON AVENUE.

The next article will be "Sterilization of Utensils and Instruments for Operation."

TREATMENT OF FRACTURED SKULLS.

It is conceded that cases of linear fracture of the vault without symptoms pointing to serious intracranial injury should be kept under close observation, while all cases of bending fracture of the vault should be subjected to operation even though symptoms of intracranial injury be absent. If there is the least doubt in the surgeon's mind as to the viability of the elevated fragments, or the possibility that the latter will press unduly on the dura, it is imperative that these fragments of bone be removed. In all gunshot wounds of the vault the depressed fragments of the inner table should be removed. Punctured wounds are explored if intracranial symptoms appear.—EDMUND A. BABLER in *The Journal of the Missouri State Med. Ass'n.*

THE TREATMENT OF IMPAIRED FUNCTION AFTER FRACTURES ABOUT THE ANKLE.

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From the sociological point of view the restoration of function in the foot after a fracture about the ankle is of the greatest importance to the community. In orthopedic clinics this is frequently brought to mind when a number of patients are seen limping with the aid of canes and crutches for months after an injury. The sociological aspect of such conditions in large cities has been carefully studied and has resulted in a splendidly equipped Social Service Department in some of the larger hospital clinics. A vast amount of good work is being done here in cases of lame bread-winners by procuring light work for skilled workers who have been handicapped, thus shortening the total period of idleness.

In assuming the management of a stiff ankle after a fracture, it is necessary to ascertain the most potent factors causing the disability. As a rule, these are edema and swelling, joint adhesions, tender callus, muscle stiffness, ligamentous contractions, nervous hyperesthesia ard fear of use. All of these items may exist together.

A most peculiar case was seen recently in which a man was noted to have a foot-drop after a fracture of the tibia. It was only upon the closest questioning that he announced that he was unconscious for a short time the day of the injury. He had, in fact, sustained a sharp transient hemorrhage into the internal capsule, in falling on his head from a telegraph post. A well fitted ankle brace and some iodides were the means of restoring his function in a very short time.

The fact that the foot is a weight-bearing mechanism renders it a peculiar problem after fractures about the ankle. There may be no interference with any of the motions of the ankle or joints below the ankle; there may be no interference with the action of any of the muscles or ligaments in this locality, yet a tender callus may be just enough sensitive to prevent the patient using it in weight bearing.

This factor deserves mention because it is not often discussed in text-books on fractures. It is best handled by appropriate resistance movements of which I shall speak later.

In examining for disability a very important phy-

sical sign is the patient's gait and its observation will often give an important clue in the direction of treatment. When at a trial for damages several years ago, the defendant was asked why he charged enormous sums for making shoes for his patrons, he replied, "The greater part of my charges are for diagnosticating my customers' gait." This charlatan realized the value of inspection in diagnosis.

A stiff gait, for instance, will be very easily diagnosticated from a foot-drop, and distortions such as turning in or turning out of the foot will be noted, as well as the gingerly gait of a tender, painful foot,

Fig. 1. A portable pivot machine for passive motion of the foot.

in which case a cane or crutch is often necessary. The greatest hyperesthesia in my experience is encountered after compound fractures in which nerves have been torn and scars are tender.

Most text-books recommend after fractures active and passive motion and massage. This trinity is the keynote of the treatment of all fractures resulting in stiff joints, but their application requires frequently the knowledge gained by experience and careful attention to detail; otherwise, the orthopedist would very rarely be consulted after fractures of this sort.

In an attempt to prevent flat-foot after Pott's fracture I have often seen marked inversion deformity of the foot as well as toe-drop caused by the over zeal of the surgeon. Such a foot will be very tender about the ankle, painful in bearing weight, the heel does not bear its share of the weight, too much weight is borne on the outer side of the foot on the smaller metatarsal bones. Cases of this sort, when recent, I have frequently reincased in plaster with the foot at right angles to the leg and everted as far as possible; the patient walking in this apparatus for ten days is soon ready for active and passive motion and massage. A shortened heel cord, it might be mentioned in passing, is effectually stretched by the use of Shaffer's equinus stretcher, a machine which I have often used with satisfaction.

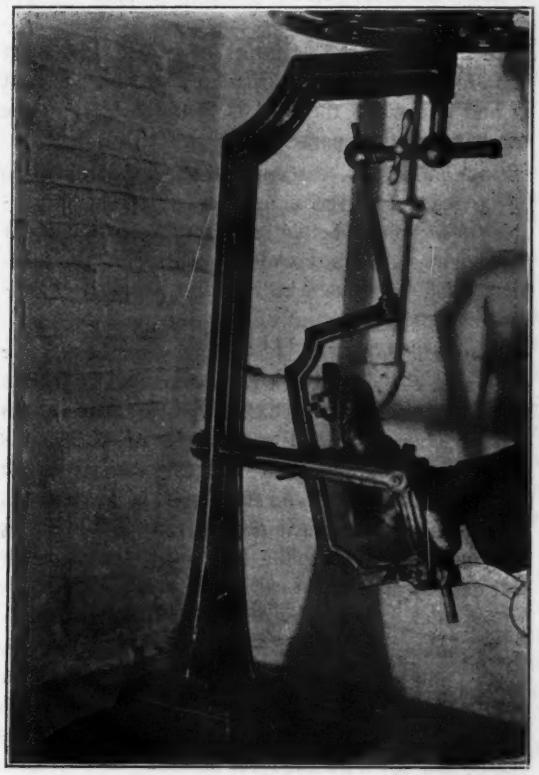

Figure 2. Zander circumduction machine for the foot. Useful in traumatic flat-foot.

Pendulum Machine.—This consists of metal bars swinging from an axle to which are attached foot pieces of metal; the foot pieces are supplied with ankle straps adjusted in such a manner that patients will flex and extend the ankle resisted by various weights fastened to the pendulum. The arc of motion can be adjusted to individual cases, likewise the weights. These machines are of distinct advantage, exercising atrophied ankle flexors and extensors, tearing adhesions loose, dispersing effusions, all without bearing weight, the patient being seated in a chair.

Zander Machine.—The Zander machine for circumducting the foot is a more complicated apparatus than the foregoing, but very effective in overcoming adhesions and correcting distortions below

the ankle. The patient, seated in a chair, rests his heel upon an appropriate cup, while the front of his foot describes a circle, the center of motion being located about the head of the astragalus. The principle here, again, is resisted motion to overcome rigidity. The best natural method of restoring function is, of course, walking.

Resisted Movements.—The patient seated upon a table, the manipulator grasps the forefoot and commands the patient to move his forefoot forward and downward as far as he is able, just short of fatigue. He is then instructed to turn his foot in and out while the heel is firmly held with the left hand of the operator.

Circumduction.—Circumduction of the foot is to be carried out in the same manner. It is remarkable how much better results are obtained by trained masseurs in thorough control of their patients than by those who have no personal experience in the carrying out of these exercises.

Passive Motions.—The importance of passive motion in the sixth week after fractures about the ankle cannot be overemphasized. One must bear in mind the anatomy and physiology of the joints under consideration, their ranges of motion, the feelings of the patient and the results to be obtained. For instance, a certain amount of force will break up joint adhesions, while twisting a foot too far will destroy an efficient callus formation. There are no set rules except those learned by experience.

The ankle in a normal foot can be flexed dorsally to 85°, and in fractures about the anterior lip of the tibial mortise or of the malleoli, this motion is occasionally limited by bony blocking, and no rules can be laid down for the force necessary to overcome this obstruction.

The normal extension of the foot is about 35° beyond the right angle. Attempts to overcome obstructions that prevent this motion are not harmful, in my experience, and they should always be tried. If the foot is stiff in varus, in eversion or adduction, attempts to overcorrect should be made daily, stretching adhesions, loosening tendinous contractions and, as frequently seen in fractures of the os calcis, frequently stretching ligaments of uninjured joints to compensate for a vicious union in the heel. These impacted fractures of the os calcis and astragalus occurring so often where large building operations are carried on, as in New York, in falls from great heights, result in almost useless heels and deformed feet. They were often not recognized before the advent of the *x*-ray. They left a thickened tarsus of extreme tenderness. The foot is most often twisted in a position of eversion and abduction, the garden variety of traumatic flat foot. The correction of this deformity usually requires an anesthetic and plaster of Paris encasement for six weeks.

Massage.—To active motion the most valuable adjunct in the treatment of disabled feet is massage. Here, again, a skilled worker is worthy of his hire. Contraindications to massage are macerated epidermis from protracted application of wet dressings or sweating in a plaster dressing, improperly healed granulations, etc. While not advocating massage treatment of fractures, I believe in its early application. The patient should be seated, the skin thoroughly dry and powdered, and the leg gently stroked to empty the engorged veins above the lesion and to diminish somewhat the proximal local edema. Then, beginning at the toes, the masseur firmly kneads, strokes and manipulates the skin and subcutaneous tissues of the sole, ankle, calf, etc. A series of mild passive motions are again gone through and the extremity is then firmly and forcibly stroked from toe to knee. The process should take at least twenty minutes and should be done morning and night for the first ten days, and then as often as the increase in the patient's strength and weight-bearing faculty indicates.

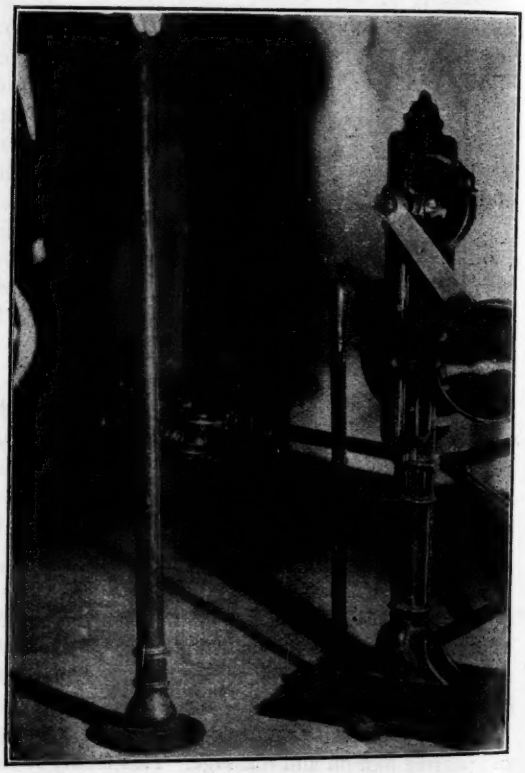

Figure 3. Exerciser for developing strength of calf muscle. "Zander mountain climbing apparatus."

Hot and Cold Applications.—Hot compresses at night (towels wrung out of hot water) frequently changed, are of service. Heat always diminishes muscular stiffness in joints.

Electricity is of slight assistance and vibration is useless about the ankle, the many unprotected subcutaneous bones not permitting unregulated pounding such as this machine furnishes.

The hot air apparatus has proven of greater service in cases of exuberant callus. Here care should be taken to avoid excessive degrees of heat, the skin should be carefully protected to avoid burning (which I have often seen in an electric apparatus). The application should be made daily. I usually order the machine exercises, motions, manipulations and massage "directly after" the use of the baking.

Apparatus.—Pain and disability, if flat foot is present, are to be met by means of an apparatus that will invert the foot, provided the foot is not rigid and the deformity is not confirmed, but can be corrected with the hands. A flat foot arch is constructed on a plaster model of the foot and worn as long as is necessary to relieve discomfort. Some cases of tarsal fracture, especially when impacted, as mentioned before, require support. Plaster strapping of the ankle and tarsus needs no description except to warn against excessive tightness for it has caused decubitus; if worn too long at a time the skin may become excoriated. It is, however, to be recommended whenever there is evidence of laxity or weakness of ankle or dorsal ligaments. A substitute in cases where this is not tolerated is a crape bandage, but for firm support and protection the very best means of meeting vulnerability to ankle injury is a steel brace or ankle support, jointed at the ankle and fitted with a calf band. These act best when riveted to the shank of the shoe and arranged with a stud joint in cases of foot-drop and fitted with a pad over the astragalus in cases where there is a tendency to sagging of the arch, and with a pad on the opposite side, that is, under the external malleolus when the foot has a tendency to turn in varus.

A properly fitting brace or ankle support of this kind will frequently be the means of discarding crutches or canes, so thoroughly is the weakened ankle splinted. Shoes with stiff counters are not recommended.

In clinic practice the oblique sole made by piling up the inner side of the shoe one-eighth or one-quarter of an inch (heel and sole) is a cheap method of counteracting eversion as in traumatic flat foot.

591 LEXINGTON AVENUE.

LOCAL ANESTHESIA.

ARTHUR E. HERTZLER, M.D.,
KANSAS CITY, MO.

OPERATIONS ON THE THORAX.

The thoracic of all organs presents the most frequent positive indication for the use of local anesthesia. The very existence of a disease involving these organs places at once a contraindication against general anesthesia. The various affections of the lungs and pleural cavity furnish the most frequent objects for surgical attack, but the circulatory organs are beginning to receive the attention of surgeons.

Pleural effusions, emphysema and lung abscesses may all be satisfactorily operated under local anesthesia. It is of interest to note that the disastrous accidents attending operations for these diseases are strangely infrequent when they are done under local anesthesia. It is in exceptional cases only that a general anesthetic is permissible. Decortication and thoraco-plastic alone demand a general anesthetic and in these the available lung space has become accustomed, because of the chronicity of the disease, to the performance of the respiratory function and in consequence the use of general anesthesia is less dangerous than in acute conditions in which the respiratory system has not yet reached an adjustment to the new conditions.

Exploratory Puncture.—The diagnosis of fluid in the pleural cavity is made easily from physical signs alone, but in some instances difficulties present themselves and it is advisable in all cases to demonstrate the presence of fluid by exploratory puncture before aspiration is attempted.

The most convenient site for puncture is in the seventh, eighth or ninth intercostal space (Fig. 1), in the anterior mid or posterior axillary lines. When the amount of fluid is small, points nearer the spine must be selected.

An ordinary hypodermatic syringe fitted with a standard needle is sufficient if the thoracic wall is thin. In many instances a longer needle is required. The caliber of the needle is dependent upon the character of the exudate. In fresh exudations a fine needle is satisfactory, but in long standing exudates or purulent effusions a needle of larger caliber is required. A syringe capable of being boiled with the needle should be employed. If such cannot be obtained the needle should be boiled and the syringe chemically sterilized, preferably with formalin or iodine. The skin may most conveniently be prepared by painting it with tincture of iodine or by soap and water, followed by alcohol. Many

practitioners use no anesthetic in making the puncture, but a local anesthetic removes the pain at and after the operation. Freezing effectually prevents pain in the skin from the initial prick, but is evanescent and is attended by after pain. Salt and ice pressed against the skin for a minute or two lessens the sensibility to a considerable degree. Neither of these methods produces an anesthesia lasting long enough to permit a careful exploration. Injection anesthesia is, therefore, preferable because it not only permits the operator to study the character of tissue through which the needle passes but if therapeutic measures are to follow the exploration the operation may proceed at once. Quinine because of its efficiency and duration is the most suitable substance to be employed. Ten or twenty minims of a 1 per cent. solution is drawn into the syringe, a fold of skin over the intercostal space in which the puncture is to be made is caught up between the thumb and forefinger, making it anemic and thus less sensitive. The needle is made to penetrate the skin at a slight angle and a few drops of the fluid are deposited in the skin. The needle is then gradually forced inward above the next rib below in order to avoid the intercostal vessels which lie in the groove of the upper rib. As the needle reaches the pleura the resistance is increased or the patient experiences slight pain. The remainder of the anesthetic fluid contained in the syringe is deposited at this point. An interval of a few seconds permits anesthesia to become effective and the needle may be pressed into the pleural cavity. The sudden lessening of resistance indicates the penetration into the pleural cavity. The syringe is then steadied with the left hand while the right gradually withdraws the piston. If the fluid is present it should appear in the barrel of the syringe. If no fluid appears it is either absent or the needle may be too short to enter the thoracic cavity or the fluid may be too thick to pass through the needle. If there is no fluid present the needle will strike the visceral pleura, which can be felt by the operator and usually the patient complains of pain. If there is doubt about the entrance of the cavity by the needle a longer one should be employed. If the physical findings for fluid are definite and the case is of long duration the possibility of the presence of a fluid too thick to pass the needle must be entertained and a needle of larger caliber employed. Adhesions at the site of puncture may give a negative aspiration. In that event the same procedure must be repeated in other likely situations. If the site of an adhesion is punctured the needle enters the lung. This is manifest by the entrance into the syringe of bubbles of air covered with blood.

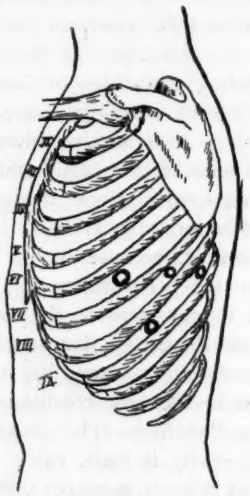

Fig. 1.

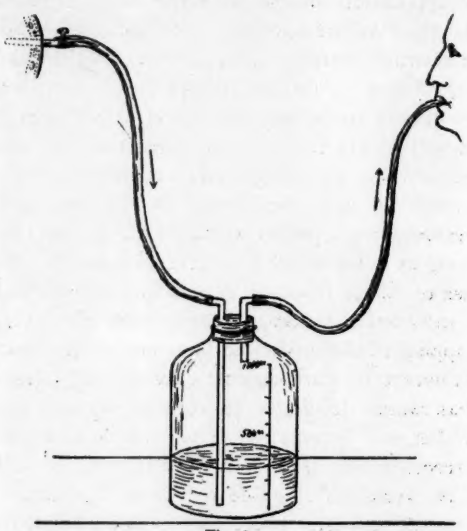
Fig. 2.

Thoracentesis. The former practice of awaiting resorption of pleuritic exudates has very properly given place to the removal of the fluid by aspiration. It has been the practice to await urgent symptoms or conclusive demonstration of the inability of the system to absorb the fluid before operation was resorted to. It is now becoming generally recognized that the absorption of the fluid even in the favorable cases is capable of injury to the patient. The sole objections to the operation are the danger of converting a sterile into a purulent exudate and the discomfort to the patient from the operation—or to the doctor if he be over-timid. All these ob-

jections can be effectively obviated by the use of local anesthetics.

Apparatus. The correctness of the diagnosis having been demonstrated by exploratory puncture the question of the removal of the fluid must be decided. This may be best undertaken at the time of the exploratory puncture, for it saves the patient a second annoyance and the doctor a second preparation. The clinical diagnosis should be sufficiently accurate to determine the character of apparatus which will be required. The exact point where fluid will be obtained is known from the previously performed puncture. A tract for the aspirating needle in case aspiration alone is needed

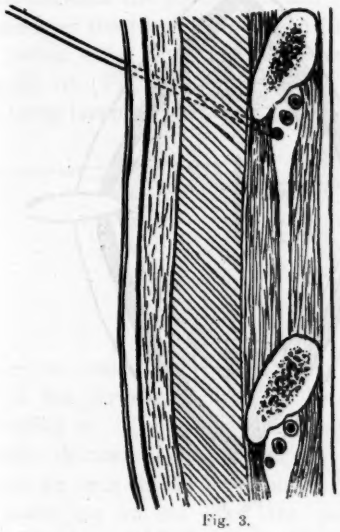

Fig. 3.

is already anesthetized, the interval between the puncture and the aspiration permitting perfect anesthesia to take place.

In the absence of more suitable apparatus a syringe holding a few drams fitted with a stopcock may be employed. It is a slow method and is trying to both patient and operator, but it is possible to remove large accumulations with this simple apparatus. The most suitable apparatus is the Potain aspirator, an instrument which should be in the hands of every practitioner, for if he is awake in his diagnoses he will find sufficient use to warrant its purchase. The principle of this apparatus is that of an air pump and its purpose is to produce a vacuum within the container intended to receive the fluid which will outbalance the negative pressure of the thorax and thus prevent the formation of a pneumothorax. A simpler improvised apparatus (Fig. 2) may be employed. A cork with double perforations is fitted with two glass tubes to which are fitted lengths of rubber tubing. To one of these the aspirating needle is attached and the other is employed by the operator to make suction to counterbalance the intra-thoracic pressure of the patient. Whether a needle or trochar shall be used is a matter of personal preference. The tracer being dulled enters less readily but has the advantage that when the stylette is withdrawn there is no sharp point to injure the expanding lung. The needle, on the other hand, enters readily, easily injures the lung, but it enables the operator to judge the character of the tissue through which it passes.

Technic. All apparatus coming in contact with the patient should be prepared by boiling. The

Fig. 4.

hand of the operator should not touch that portion of the needle which is to enter the tissue. The needle is passed along the tract of the puncture already anesthetized. This may now be accomplished without pain. It is often desirable to nick the skin with a scalpel, for the pressure of forcing a none too sharp needle may annoy the patient. The preliminary use of the scalpel is particularly indicated when a trochar is used. The point when the parietal pleura is passed will be perceived by the operator. Suction may now be begun. If a Potain apparatus is employed the cock on the tube leading from the aspirator may be opened (the air having been previously pumped from the bottle) and the fluid will trickle into the bottle. When the flow ceases the stopcock on the tube leading from the aspirator is closed, the one leading to the pump is opened and the pump started. When sufficient vacuum has been created within the bottle the cock on the pump-end is closed and the other is opened, when the flow will start again. If the operator is

sure his apparatus is working well the pump may be worked with both cocks open so that the fluid flows into the bottle as the air is being exhausted by the pump. If the improvised apparatus is employed when the aspirating needle is in position suction is made on the lead tube. The pinchcock on this tube should not be released before the tube is in the operator's mouth and suction started. The pinchcock must be reapplied each time the operator pauses to renew his breath.

Amount of Fluid to be Withdrawn. Whether all the fluid obtainable is to be withdrawn at the first sitting depends on circumstances. In neglected cases when a considerable amount of fluid is withdrawn a temporary irritation indicated by coughing may attend the expansion of the lungs or the replacement of the heart to its normal position may cause a sense of faintness. Either of these sensations, if at all marked, should be a signal to the operator to desist. In early cases the first evidence of discomfort is evidenced when the fluid is nearly all removed and the expanding lung causes the visceral pleura to come in contact with the end of the aspirator. Often by slightly withdrawing the aspirator or tilting the tip downward the pain can be relieved. When the operation is ended the aspirator is withdrawn and the opening is closed with gauze and collodion or adhesive. If it is necessary to interrupt the aspiration before the fluid is all withdrawn aspiration should be repeated after an interval of a few days.

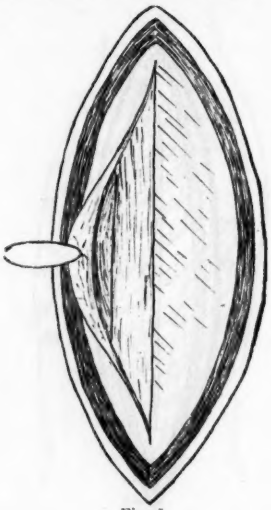

Fig. 5.

Permanent Drainage. Purulent fluid requires a permanent exit. In children this is satisfactorily accomplished by the introduction of a fair sized (say 26 F) soft rubber catheter through a simple intercostal incision. A large trocar is sometimes employed through the sleeve of which the catheter is pushed and the sleeve withdrawn. It is often possible to employ this method under local anesthesia in quite young children. This method is especially efficient when permanent suction is applied to the drainage tube. This has been accomplished in various ways. The simplest method is by the permanent application of a Potain aspirator. The negative pressure in the receiving bottle is kept at the point of easy tolerance.

Rib Resection. In empyema, except in children, the resection of a rib is necessary in order to secure satisfactory drainage. Its diagnosis is less certain than is serous fluid by physical means alone, but before operation it is always advisable to demonstrate its presence by puncture.

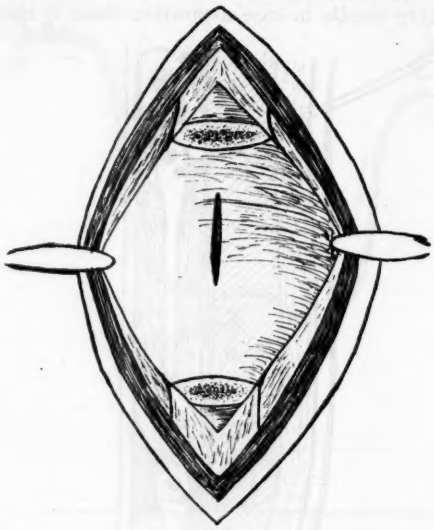

Fig. 6.

Instruments Required. The resection of a rib is a simple operation, but since it is always done upon a dysponeic patient the complications are often annoying, and instruments sufficient to meet all possible emergencies should always be at hand. Aside from the usual syringe and solution for local anesthesia, a rib shears or a bone cutting forceps, a periosteal elevator, knife, scissors and a number of hemostats and a needle threaded with catgut should be provided. The latter may be needed should the intercostal vessels be inadvertantly severed.

Technic.—The site of operation is selected, usually the seventh or eighth rib at the mid-axillary line and an area of skin disinfected either by iodine or soap and water. A line of skin three inches long is injected over and parallel with the

rib selected for removal. The area immediately beneath the rib at both ends of the line of injection in such a manner as to deposit a pool of fluid about the intercostal nerve (Fig. 3). Next the periosteum over the rib is freely injected. If the operator is not experienced in the use of local anesthetics it is better to wait until the periosteum is exposed before injecting it. A wait of a few minutes permits anesthesia to take place. An incision is made through the skin the length of the line infiltrated. The muscle over the rib is next incised. All hemorrhage should be controlled at this point. If the periosteum was not injected at the time of the initial infiltration it is now infiltrated by passing the needle between the periosteum and rib. The periosteum over the rib is then incised for a distance of two inches (Fig. 4). The periosteum is elevated from the rib (Fig. 5) about its entire circumference, care being taken to remove it from the groove containing the intercostal vessels. The visceral surface of the periosteum must be loosened without perforating it. The periosteum being loosened for the entire distance of the incision the rib may be cut. At least an inch should be removed. The opening thus made has for its floor the periosteum and parietal pleura. All hemorrhage should now be checked. If the periosteal vessels have been cut they may be controlled by mass ligatures through the muscle. When all hemorrhage has been controlled the drainage tubes are made ready and the periosteum quickly incised (Fig. 6) and the tubes passed into the opening. The tubes must be sutured to the skin in order to prevent their slipping into the thorax. Many operators permit the pus to flow out before a dressing is applied, others prefer to quickly apply a large snug dressing and permit the pus to gradually soak into this.

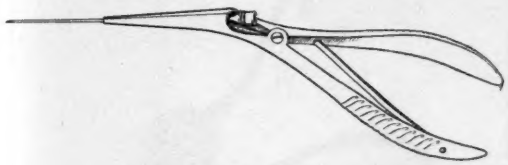

Fig. 7.

If the visceral periosteum is inadvertantly opened the pus flows at once and the cutting of the rib and the control of any hemorrhage that may appear must be done in a puddle of pus.

After Treatment. The duration of the quinine anesthesia is such that nothing is required for postoperative pain. The dressings must be removed as they become soiled. After the flow has lessened the tubes are gradually shortened and can usually be removed in from two to six weeks, depending on the nature of the infection, the earlier period of the pneumo-coccus or influenza bacillus is the infective agent, the longer if the empyema is secondary to some infection of the abdomen or pelvis.

Drainage of Lung Abscesses. The drainage of abscesses of the lung is difficult only in locating them. Physical examination can usually determine their presence with a considerable degree of certainty but it is only by aspiration that it can be proven and the exact location determined. The technic of exploratory puncture is not unlike that of exploration of the pleural cavity except that a longer needle is required and that the search is more prolonged and much more difficult. Physical examination must locate the lesion approximately and the point of the needle must be made to enter the suspected region. The density of the tissue which the needle penetrates can usually be perceived and often when the cavity is a considerable one the entrance of the needle into it is felt. Whenever resistance to the advancing needle suddenly ceases after passing through a comparatively dense area the piston of the syringe should be withdrawn in order to determine if pus has been reached. Often numerous punctures must be made at the same or at several sittings before the nidus of infection can be located. The needle must be removed at each change of direction. Usually withdrawing it until the point is just within the visceral pleura will permit the desired change of direction.

The pus once located the exploring needle should be left in situ and a rib resected as explained above. When the pleura has been opened the needle may be followed by closed artery forceps in order to secure an opening large enough to admit a drain. Better still is the instrument devised by me for this purpose. The needle is straddled with the instrument (Fig. 7) which is then forced through the lung until its tip enters the abscess. The blades are then separated, the needle withdrawn and a drainage tube substituted and the instrument withdrawn. This permits the tube to be introduced more quickly than if the dilatation is made with forceps.

If the pleural space is not obliterated by the adhesions of the parietal and visceral pleura the area must be packed for a few days until obliteration does take place. It is often possible to determine if the visceral and parietal pleura are adherent by the sensation imparted to the needle when it is passing from the one to the other. If there are no adhesions the movement of the lung will be felt

by the tug upon the needle. This method is by no means a certain test and it is only after a rib has been resected and the pleura opened that there is any reliable information obtainable. If the pleural space is obliterated the abscess is drained at once. If there is a free space the opening in the parietal pleura is packed with plain gauze in such a manner that it comes in contact with the visceral pleura, thus exciting adhesions. Reliable adhesions will have formed in three or four days. The method of obliterating the space by suture is not suited to local anesthesia and is objectionable because immediate suture does not certainly protect the pleural cavity from infection if the abscess be drained at once.

The opening of lung abscesses following pneumonia offers no difficulties under local anesthesia. Those following prolonged suppurative processes in the pelvis or abdomen in which the patient is often pus soaked for many months and usually more or less accustomed to the use of morphine are not favorable cases for local anesthesia. Unless the operator is experienced, both in the treatment of lung abscesses and in thoracic operations under local anesthesia, he will do better to place the additional burden of a general anesthetic upon the patient.

APPENDICITIS AND OPERATIONS.

The whole difficulty in determining the time to operate in appendicitis is largely the difficulty in diagnosis. It is impossible to determine by the physical signs as to the nature of the individual attack, for example, whether the appendix is gangrenous or not. The pulse, temperature and leucocyte count are all useful clinical guides, but neither these nor the severity of the pain, nor of reflex symptoms of vomiting, etc., are sufficiently characteristic to assist us in differentiating the simple cases from those of the most dangerous form and until an accurate clinical diagnosis can be made our only safe course is to remove the appendix the moment a definite diagnosis of appendicitis is made. There may be some instances where the general condition of the patient, or his surroundings may necessitate delay, or may cause one to conclude that the direction of least risk lies in temporizing, but these cases are exceptionally rare.—ALEXANDER PRIMROSE in *The Cleveland Medical Journal.*

A USEFUL METHOD OF CONTINUOUS STOMACH DRAINAGE FOR CASES OF POST-OPERATIVE DILATATION, INTESTINAL OBSTRUCTION AND PERITONITIS.

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There are three kinds of cases in which the rather constant use of the stomach tube is called for:

1. Cases of post-operative gastro-duodenal dilatation. In these the frequent cleansing of the stomach is essential.

2. The intestinal obstructions, in which the

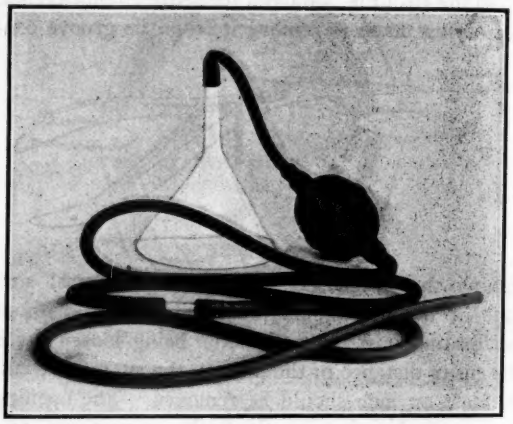

Fig. 1. Continuous drainage stomach tube apparatus.

cleansing of the organ minimizes the degree of toxic absorption so that the case is a better operative risk when the laparotomy is performed.

3. Cases of septic peritonitis, in which the gaseous distension of the peritoneal cavity and the paresis of the gut crowd the stomach into the left dome of the abdomen. In these cases to allow the drinking of water in the large amounts demanded by these patients would cause an increase of the intraperitoneal pressure, but to give them cool water by tube which can be immediately drained out again is a most humane act.

In each of these three kinds of desperate cases the suffering of the patients usually is intense, and the frequent passing of a stomach tube adds to their distress. The method here described is comfortable and painless, obviates the frequent passing of the stomach tube, and has the advantage of having a tube always *in situ* for drainage or delivering of fluids into the stomach.

The method was suggested to me on conversation with Dr. A. G. Gerster, after which the necessary tubing, etc., was assembled and used, and then an apparatus was perfected for use in a general way for all adults. This consists of a small calibred stomach tube made sufficiently stiff for easy delivery into the organ by way of the nose, this tube in size being 23 F. or 15 A, and 150 c.m. or 60 inches long. A marking on the tube 61 c.m. or 24 inches from its lower end shows when the latter is in the stomach and lying well along the greater curvature when this marking is at the nostril. The openings are like those of the Boas tube, namely, two in number, one on either side and arranged one above the other, both being velvet eyed, and the extreme end being closed. A rather thin walled, small-sized bulb is supplied to cleanse the

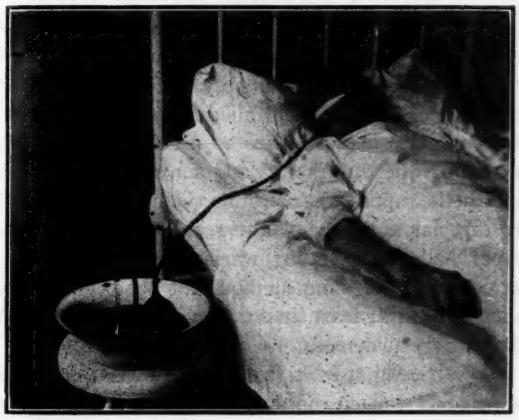

Fig. 2. Tube in use.

tube should it become obstructed, and there is a length of tubing beyond it to give further length for siphonage and attachment to a glass funnel instead of rubber to give weight to the lower end so that it always remains submerged in the water in the basin.

The introduction is made with the patient on the back. The tube, lubricated with glycerine, is passed down through the nostril on the side of the bed at which the basin stands. When the proper level in the stomach is reached for easy ingress and egress of fluids, the tube is bound in place by means of a tape or string making a turn around the head, over the ears, and tied at the occipital region; or by a short tape with plasters on the sides of the face to hold it. The outside length of the apparatus permits of a reach to a basin of water, the upper level of which should be situated about a foot below the back of the patient or on a level with the mattress; a siphonage to the floor can easily be secured by adding a further length of tubing from the bulb to the funnel, but this is rarely necessary.

It is surprising how comfortably this apparatus is borne. The majority of patients will lie perfectly at ease, can talk and even swallow, and not a few who have experienced the benefit from the frequent lavages possible by it—every fifteen minutes if necessary—will fight against its removal.

Taking the tube out for cleaning is not essential during the short time its use is called for. When, however, there is doubt as to whether the stomach contains solid particles of food, it is wise to wash the organ in the usual way with an ordinary larger sized stomach tube before this apparatus is installed. Fluid foods and medications may be introduced through the tube, a stop cock on it being necessary for their retention. In many cases when drainage is sought for, just to raise the funnel out of the water is sufficient to drain the organ without the addition of water through the tube first, and it is not unusual to see fluid from the stomach trickling down the sides of the funnel into the water as fast as it had accumulated in the stomach.

In peritonitis cases, cool water may be delivered into the stomach to allay the thirst, and quickly drained out again.

BURSITIS IN THE POPLITEAL SPACE.

The . . . bursa . . . between the semimembranosus expansion and the inner head of the gastrocnemius muscle . . . is subject to the same diseases as all others, but the commonest form is subacute or chronic synovitis which results in distention of the sac to a greater or less extent. The effect of this distention is to produce an aching pain with a sense of weakness in the joint. The swelling can usually be recognized when the limb is fully extended as an ill-defined elastic mass almost directly behind the knee which is soft during flexion and tense during extension. As this bursa usually communicates with the knee-joint its contents in slight flexion can sometimes be squeezed into it when abundant, and can be felt to distend the synovial pouches of the knee. When small this cannot be felt, but in advanced cases is quite demonstrable. In very extreme forms the knee-joint is also much distended with fluid which can be made to fluctuate easily from the joint to the bursal sac and vice versa. In such cases the bursal sac may be enormously distended and reach far down the leg.—ARTHUR E. BARKER in the *British Medical Journal.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, OCTOBER, 1911.

POSTURAL AID IN THE TREATMENT OF INTRAABDOMINAL SUPPURATION.

The now fairly general employment of Fowler's position in the treatment of diffuse and "general" peritonitis has been undoubtedly one of the three important features of the modern management of these conditions that has so greatly reduced their mortality—the other two being first, the "quick in, quick out" operation (rapid attack on the source of the infection—e.g., appendix, perforation of bowel, and rapid toilet of the pus-bearing areas with as little handling and exposure as possible), and, second, the Murphy rectal infusion and delayed feeding.

So important, indeed, does the Fowler posture appear to be in discouraging the migration of the pyogenic organisms and the spread of the pus towards the upper zone of the abdomen that its employment should not be reserved for the postoperative period, but should be instituted as soon as the diagnosis is made. Mere elevation of the head of the bed may accomplish the desired result, but it is far better to prop the patient up in an almost sitting position.

The mistake is often made, however, of continuing the Fowler position after it has ceased to be useful, that is to say, after the inflammatory process has localized itself. Gravity having limited the suppuration to the lower abdomen should now be invoked to coax the pus from the pocket (often the pelvis) in which it has been encouraged to remain. And thus, a few days after operation, when the peritonitic storm has subsided, the most rapid drainage of the pus becomes an important problem. It is then that a reversal of the patient's position from Fowler's to Trendelenburg's, or to the lateral horizontal, or to the horizontal posture prone on the belly for several hours a day, will often go a long way toward hastening the cure. Indeed, in many instances the subsequently necessary gravity drainage through the rectum or vagina might have been obviated by the timely and intelligent employment of gravity drainage through the original abdominal incision.—W. M. B.

CONCERNING WARMED ETHER VAPOR.

The pathogenesis of ether pneumonia is by no means clear, but among the explanations advanced "refrigeration" of the lung by the narcotic vapor has been allowed to hold an undisputed, if unconvincing, place. And so, from time to time, we have heard of the desirability of employing warmed anesthetic vapors, the warming being accomplished by especial apparatus. For rectal etherization the vapor had always been "warmed"; for pulmonary narcosis the warming method had not been widely adopted, but at least, its rationale, had never, until recently, been denied.

Now, Seelig, of St. Louis, who has punctured some other fallacies in surgical practice, demolishes the fabric of "warmed ether vapor." In the *Interstate Medical Journal*, September, 1911, he calls attention to the fact that gases have low specific heat —their temperature is readily raised by a small amount of heat, and they have small capacity for holding heat. By simple experiments, Seelig showed that:

"When ether vapor is driven through a very circuitous coil that is heated, it is for a time under slight pressure and may take on a degree of heat higher than 97° [its boiling point], but the moment the vapor emerges from its field of compression, it expands and cools with astonishing rapidity," and "chilled vapor also tends to assume room temperature very rapidly."

"The experience of the tobacco smoker furnishes an equally emphatic confirmation of the rapidity with which gases lose their heat."

"To test the question of lung refrigeration, the following procedure was resorted to. A dog was tracheotomized under local anesthesia, and a delicately calibrated thermometer inserted through the tracheal wound as far as the division of the bronchi. After a few minutes a reading was taken, and then ether was administered

by the drop method. The column of mercury did not vary. Ether was then poured on the mask in very liberal quantities, so as to insure rapid evaporation and chilling, but even this procedure caused no drop in the column of mercury. After the animal had been under the anesthesia for some time a drop of 0.8° C. was noted, but this drop occurred also when the ether vapor was passed through hot water. The fact that the bronchial air is not lowered in temperature, despite the fact that the inspired air is cooler than normal, is explained by the normal rapidity with which the inspired air assumes room temperature, plus the fact that the warm nasal, pharyngeal and tracheal passages all tend to aid in the process of warming."

We doubt whether apparatus for warming ether vapor will be much seen in our operating rooms!—W. M. B.

MEDICAL SLANG.

In an article by one of America's most prominent surgeons and medical authors, very recently published in a State journal, we find the passages: "after removal of an acute appendix" and "the unmasking of a chronic appendix in ambush." Of course, the author means by "an acute appendix" "an acutely or chronically inflamed appendix" or "an acute appendicitis." But why carry the inelegant slang of the operating room into the manuscript of a presumably dignified address, into the printed page of permanent medical literature!

"An acute appendix" is of a piece with "the patient had no temperature" and with the numerous other instances of slang that are found in the manuscripts of those who ought to know better. They constitute one of the several unnecessary burdens cast upon the careful editor by writers who would feel aggrieved if they were accused of carelessness. —W. M. B.

Surgical Suggestions

In trachelorrhaphy care must be taken not to close the cervical canal at any point.

When tuberculous involvement of the Fallopian tubes is evident to the naked eye, pan-hysterectomy should be performed.

Vaginal hysterectomy is more dangerous than abdominal hysterectomy when the uterus is adherent.

Simple perforation of the uterus during a curettage in an aseptic field requires no further treatment than a packing of gauze in the uterus.

A chronic suppuration in the middle ear may be due entirely to an adhesion near the floor and internal wall, forming a pocket in which pus may lodge.

Irrigating the throat with ice water from a fountain syringe will frequently relieve the congestion and give great comfort in cases of acute follicular tonsillitis.

The "safe-triangle" or "interpleural space," for exposing the heart, is at the left edge of the sternum behind the three lower costo-cartilaginous attachments.

In case of primary hemorrhage, cut vessels which are not bleeding need not be ligated, provided the patient can be watched. When the vessel can not be tied in the wound, ligation in continuity is permissible.

The treatment of varicose veins is not completed until the surgeon has discovered the constitutional causative factor and advised its elimination.

In removing extensive varicose veins, the surgeon should bear in mind that two operators can accomplish twice as much as one.

Better than temporary ligature of a large vessel is the application of a soft clamp which can not damage its wall. In the absence of such a clamp an assistant may cause occlusive angulation by making gentle traction upon a ligature passed under the vessel.

After the ligation or occlusion of large veins, the important means essential to the re-establishment of the collateral circulation is the preservation in its best possible vigor of the arterial circulation.

Both ether and chloroform anesthesia have a hemolytic effect, which is followed by a compensatory polycythemia. It is followed also by 30 per cent. increase in the leucocytes, which begins during anesthesia and lasts for about 24 hours. Leucocytosis is also induced by saline infusions and purgation.

Surgical Sociology

Ira S. Wile, M.D.
Department Editor

The schools are again in full blast. Teachers and books are rubbing against the active, but not always willing brains of childhood. The days of study, application and mental stimulation have again come upon many homes throughout the vast country. Citizens are being trained for the work of the future. The average of school training for the country is all too low. With a compulsory education law there are a few States that compel parental sacrifices that children may be given an education. Childhood is protected from the exploitation that is so often forced upon it by the lack of an adequate living wage to be obtained by the father or the mother or both.

There is an important relation between the efficiency of the public school system and the morals of a community. The interrelation of delinquency, degeneracy, dependency and faulty educational methods and laws is too apparent for further comment.

The minor is the ward of the State, and though the onus of the crime of strangling childhood in the dusty atmosphere of the mine, the factory, and the mill falls upon parents, the guarding foster-parent, the State, may not be relieved of its full responsibility for not restraining the ignorant or greedy parent from feasting upon the labor of his child, and too often almost upon the child itself, who is sacrificed. Child labor is child belaboring. In the eyes of physicians and surgeons and hygienists it can have no defense.

Industrial attrition of children grinds down the child mentally, morally, and especially physically. Illiteracy, the limited attention of early life, the early incidence of fatigue after monotonous effort, the lightheartedness of boyhood that interferes with an intelligent appreciation of the dangers of industry make the rate of accidents for child laborers a source of shame to those who are impressed with the necessity of placing even the lowest value upon human life.

If conservation of the natural resources is more than a name there is reason for the immediate activity of those who believe in the protection of the greatest asset of the country, the future citizens.

The National Child Labor Committee is ever enlightening the public and fighting legislatures. Mills and mines and oyster beds are taking the vitality of the children engaged in harmful labor when they should be under a development more advanced than that of the industry that is blighting them. Mr. Roosevelt has well said, "The human being is the most important of all products to turn out."

Seven States permit the employment of children under 14 years in factories. Eight States, including Pennsylvania, permit the slaving of boys under 12 years in the mines. Children 8 years of age are to be found in the glass factories and the coal mines. The convict, a parasite on the social organism, is better protected from the injuries to be encountered in industry than is the child who is being robbed of his heritage. The old man of 16 years is being subjected to long hours, dirty atmosphere, underfeeding, unnecessary dangers that would not be permitted to exist in a fair institution for the care of the malefactors of little wealth. Disease and accident form the frame of this unpleasant picture of child labor. And the picture is worth very little in actual weekly wage to the child. The average weekly earnings of children under 16 years in 25 selected industries for the year 1895 was $3.46. That is not the price the community pays nor does it represent what the children pay for it.

Statistics bearing upon the relative frequency of accidents are none too numerous, and they are especially silent where the incidence of accidents to children is concerned. In a recent report on the cotton textile industry issued by the United States Government, under the head of accidents in 89 southern mills, one learns that the rate for all employes 16 years and over is 13.8 per 1,000 and for all employes 14 and 15 years it is 20.4 per 1,000.

A few quotations from this report are suggestive. Referring to the accidents from belts and gears, it is stated: "The rate for the child is *more than double* that of the older worker in this group, where the loss of a part of a finger is the mildest occurrence. In these cases they varied among the children from the loss of a fingernail to the loss of an arm. The child is, then, apparently more liable to all kinds of accident, and especially liable to those of severity." "Another phase deserves attention. A given injury is a more serious matter for the child. Surgeons always hesitate to perform operations upon the young which would be instantly used with more mature patients. The shock of an operation disturbs the poise of an immature organism much more than where the progress of time has hardened the resisting powers. With the adult there is little beyond the direct disability of the accident itself. With the child there is much more likely to be a far-reaching series, the intrusion of infectious disease at an unguarded moment, a lasting damage to the functions of the nervous system, leading forward to consequences of the most serious kind in after years. A long history of degeneracy and dependence may have its beginning in exposure to industrial hazard."

The Minnesota report for 1909-1910 shows a general accident rate of 27.56 per 1,000, while for children under 16 years the rate was 70 per 1,000.

The Pennsylvania Department of Mines in 1907 showed that while approximately 50 per cent. of the slate pickers were boys under 16 years, 75 per cent. of the accidents in this group fell upon these boys under 16, and only 25 per cent. occurred to the youths and men above this age.

Corroborative figures are yielded by France in metallurgy, for example. The rate of accidents per 1,000 for workers under 18 years was 349, as compared with 260 per 1,000 among workers over 18 years of age. The rate of permanent disability in

all the accidents reported during 1908 was for men under 18 years, 1.42 per cent.; for girls under 18 years, 2.21 per cent., while for men over 18 years it was 1.39 per cent. and for women over 18 years it was 1.74 per cent.

In Germany striking testimony is borne by the figures supplied by the industrial accident associations for 1897. Eight and sixty-three hundredths per cent. of the total number of pensions paid went to workers under the age of 15 years. The severity of these injuries may be understood by the fact that these 8.63 per cent. of the pensions covered 28.49 per cent. of the total number of days for which pensions were paid.

The Commissioner of Labor of Kentucky in his 1905 report wisely remarked: "Humanity, charity, education, civilization demand that the system of making little children industrial slaves be abolished." The process of stunting, blunting and maiming must cease. Let us have more letters and less litters for the children.

Book Reviews

A Manual of Surgery for Students and Physicians. By Francis T. Stewart, M.D., Professor of Clinical Surgery, Jefferson Medical College; Surgeon to the Germantown Hospital; Out-patient Surgeon to the Pennsylvania Hospital. *Second Edition.* Octavo; 682 pages; 553 illustrations. Philadelphia: P. Blakiston's Son & Co., 1911.

The chapters on diagnosis and treatment have been entirely revised and many additions made to the volume to keep abreast of surgical progress. This edition has been considerably augmented, certain of the older methods have been discarded and the classification has been simplified.

The illustrations have been carefully selected and, as in the former edition, much care has been exercised so that the book might meet the requirement of students in undergraduate work.

Hospital Management. A handbook for hospital trustees, superintendents, training school principals, physicians and all who are actively engaged in promoting hospital work. Edited by Charlotte A. Aikens. Octavo; 488 pages; illustrated. Philadelphia and London: W. B. Saunders Co., 1911.

This volume represents and interprets advanced ideas in hospital organization, administration, construction and management. A book covering this large field has long been needed; and the want has been well supplied.

Particularly valuable are the chapters on The Medical Service of a Hospital; The Kitchen; The Dietitian's Province and its Management; The Out-patient Department; The Purchase and Economic Use of Surgical Supplies. The discussion that is given to the annual report is all that could be desired. The appendices dealing with training school regulations and suggestion are valuable for those to whom it may be given to undertake the organization of a training school. The appendix on Hospital Dietaries offers suggestive menus for all the various classes of patients and employes who are to be found within the confines of a hospital.

Dedicated to the members of the American Hospital Association, this volume does them honor and reflects great credit upon the editress as well as the contributors. Not alone is the book creditable but what is of equal importance because of the wide circle for which it is written, it is most interesting and readable.

Manual of the Diseases of the Eye for Students and General Practitioners. By Charles H. May, M.D., formerly Chief of Clinic and Instructor in Ophthalmology, Columbia University, N. Y.; Ophthalmic Surgeon to Mt. Sinai Hospital; Consulting Ophthalmologist to Bellevue Hospital, the French Hospital, the Red Cross Hospital and the Italian Hospital, New York. *Seventh Edition,* Revised. Duodecimo; 407 pages; 362 original illustrations, including 22 colored plates. New York: Wm. Wood & Co., 1911. Price, $2.00.

This well known and remarkably successful manual needs no further review in these columns. In this, the seventh American edition, the author has allowed an expansion of the book of only 16 pages, but the text has been carefully revised and brought up to date. There is, too, a new chapter, "The Ocular Manifestations of General Diseases."

It is interesting to note that in eleven years this manual has been through seven American editions; has been reprinted eight other times, and has been translated into German, Italian, French, Dutch, Spanish and Japanese.

Handbook of Suggestive Therapeutics, Applied Hypnotism, Psychic Science. A Manual of Practical Psychotherapy. Designed especially for the General Practitioner of Medicine and Surgery. By Henry S. Munro, M.D., Omaha, Nebraska. *Third Edition,* revised and enlarged. Octavo; 409 pages; illustrated. St. Louis: C. V. Mosby Co., 1911. Price, $4.00.

The third edition of Dr. Munro's book contains eight entirely new chapters, which, together with the enlarged and rewritten chapters of the preceding editions, constitute an embodiment of the recent advances in psychotherapy, though still holding to all of the practical technic of the second edition.

The first half of the volume deals particularly with hypnotism and explains in a very clear and concise manner the various methods by which sleep may be induced and the simplicity of such a procedure in the hands of the majority of practitioners. There is no doubt of the value of hypnotic treatment as an adjuvant to other procedures and the author plainly states in the later chapters that rational therapeutics play a very important rôle in the treatment of any disease.

The author devotes a chapter to a discussion of the psychoanalysis theory of Freud and the methods employed by Jung. Although he believes that psychoanalysis plays a very important part in determining the motif of certain traits in nervous individuals, Munro does not agree that a proper interpretation can be put on all cases in this way. He says "I am unable to react to the teaching of Freud in the same manner as the man with little or no experience in the general application of psychotherapeutic procedures reacts to all classes of medical practice."

Suggestive therapeutics, as a rational procedure in everyday practice, is being recognized more and more as time goes on. Many men are beginning to take up this work as a specialty, but its chief value will be felt only when psychotherapeutics is made a part of a medical school curriculum so that it will be used constantly in conjunction with other treatment by all medical men. The author lays especial stress on this point and has written this volume for the enlightenment of the average practitioner. He has accomplished a work which is well formulated, well written and is well worth reading.

Practical Motherhood. By Helen Y. Campbell. Duodecimo; 522 pages; with illustrations. New York: Longmans, Green & Co., 1910.

Questions concerning the development and care of infants and children are constantly being asked by mothers, especially in reference to the first-born. The choice of a reference book for mothers is very often a puzzle. While this book is essentially English in referring to proprietary foods and some medicaments, the hygiene is of universal value. As a book for mothers it is most valuable, and deserves recommendation. The scope of the book extends from pregnancy to infant management; from breast feeding to first aid in the nursery; from early training to puberty and sex-training.

Scientific Medicine vs. Quackery. Should Ignorant Laymen be Permitted to Treat the Sick? By WM. J. ROBINSON, M.D., New York, President of the American Society of Medical Sociology; Editor of the *Critic and Guide, The American Journal of Urology and The Medical Review of Reviews.* Brochure; 49 pages; paper bound. Reprinted from THE AMERICAN JOURNAL OF CLINICAL MEDICINE, 1911. Price, $2.00 per 100 copies.

This brochure is a reprint of an address delivered before some association (name not stated) and published in recent issues of the *American Journal of Clinical Medicine.* The address is in Dr. Robinson's characteristically straightforward, vigorous and entertaining style. It is a statement of facts and arguments in a terse and convincing fashion and we commend the brochure for distribution as a literary weapon against the attacks made against the regular medical profession.

Progress in Surgery

A Résumé of Recent Literature.

Tumors of the Mesentery, with Report of Four Cases. H. A. ROYSTER, Raleigh, *Journal of the American Medical Association,* August 12, 1911.

Royster reports four personal observations of mesenteric tumors, one of dermoid cyst, one of sarcoma, one of hemorrhagic tumor and one of round-cell sarcoma. He does not include in his classification of these tumors the retroperitoneal growths and says that little is known as to the etiology. Some, of course, are congenital in origin and many are of long standing before recognition. It is impossible, he says, to lay down any rule in regard to diagnosis and one may often have to be contented with deciding whether or not surgical intervention is needed. Exploratory diagnosis is the surest and easiest way. Subjective symptoms are not usually distinctive and the presence of the tumor may produce conditions that would mask the diagnosis. Free mobility is the most important single sign as no other abdominal tumor shows it to the same degree. If it can be determined that the tumor is separable from the solid viscera a long step forward in the diagnosis is made. Cysts and tumors of other organs must be kept in mind, especially ovarian cysts, and cysts, generally, are more than solid tumors, the causes of diagnostic errors. Mesenteric tumors, of course, may be cystic or solid, and as cysts, serous, chylous, hemorrhagic, hydatid or dermal, as well as benign or malignant when solid. The prognosis depends on the character of the growth and danger may also be due to pressure. Early recognition and prompt removal are the remedies for both these perils, but unfortunately late diagnosis and tardy removal appear to be the rule. The mortality, therefore, has been high. In deciding on operation, one must bear in mind three points: first, is it benign or malignant? second, is it primary or isolated? third, how much intestine must be sacrificed? These are often difficult to answer, but since the last must depend on the answer to the first two, the whole matter may be resolved into the decision on the indications in any given case for resection of the bowel, and this will largely involve the question of mortality. Royster points out the dangers of resection and advises its avoidance wherever possible, and as a sort of corollary, to use special care not to wound the bloodvessels of the mesentery in extirpating the tumor.

The Surgical Treatment of Megacolon. W. I. TERRY, San Francisco, *Journal of the American Medical Association,* August 26, 1911.

Terry includes under the term megacolon both the congenital and the acquired forms of chronic dilatation of the large intestine and does not see the use of separating the congenital or idiopathic cases under the name of Hirschsprung's disease. It is impossible in the majority of cases to tell whether it is congenital or acquired. That it is sometimes congenital seems beyond doubt and the age of some of the patients would indicate that it must have been acquired. The etiology of the condition is obscure. Pathologically, it has a number of interesting features. The dilatation may go as far as 10 inches and the walls be thickened to 2 or 3 centimeters. The sigmoid is the part most involved. Occasionally coproliths of larger size are present. In a few cases a practical cure can be obtained by medical treatment, regulation of diet, cathartics, laxatives, etc. This depends on the tonicity of the colon, but it must fail if there is a definite obstruction. A few cases have been reported where no more surgery than rectal dilatation or division of rectal valves was necessary, but generally more than this is required. Colotomy is sometimes of service and colopexy has proved of value in a few cases, though ordinarily it is contra-indicated. Coloplasty has been done a few times without notable success and longitudinal plication has been performed ten times with 60 per cent. of successes. Exclusion of the bowel by anastomosis has been successful in a number of cases, and if it fails it does not usually interfere with subsequent resection if necessary. Resection would seem to be the ideal operation, though it is a more formidable procedure. Terry thinks, however, it will be more frequently performed in the future with our improvement in a technic and avoidance of shock. Two cases are reported, both in comparatively young persons, and therefore congenital. The first is an unreported one published here by the courtesy of Dr. T. W. Huntington. A hard fecal tumor was removed and a longitudinal plication was made with excellent results, the patient being perfectly well ten years later. In the second case, he also made a longitudinal plication which he thinks was a mistake and that a primary colostomy followed later by a resection, would have been better. The patient died after a second operation. Terry has been able to collect reports of 110 cases treated surgically with 74 per cent. recovery and 26 per cent. mortality. These are much better than the later statistics of Loewenstein made four years ago, which gave a mortality of 48 per cent.

Some Points in the Surgery of the Pancreas. HENRY F. LEWIS, *Journal of the Michigan State Medical Society,* August, 1911.

Taking up six cases of pancreatic disease as a text an analysis of the possibility of pre-operative diagnosis is made. Two cases of acute hemorrhagic pancreatitis were diagnosed as gastric ulcer, but were saved by the operations. There were two cases of pancreatic cyst, one of chronic pancreatitis, and one of pancreatic abscess.

There is a brief review of the history of pancreatic disease and concise discussion of the etiology. Lewis regards the Cammidge test as merely long, complicated and extremely technical, requiring an expert chemist for its performance. The presence of much fat in the stools and the detection of the normal amount of the bile salts in the feces point to pancreatic deficiency.

The picture of acute pancreatitis is that of a fulminating infectious process, causing hemorrhage and necrosis in a very short time, and, provided the patient lives long enough, suppuration. While diagnosis is rarely made before operation, the picture comprises severe pain in the epigastrium, without corresponding tenderness, feeble slow pulse, persistent vomiting and slight prominence of the epigastrium. If the excess of fat appears in the stools the diagnosis is strengthened. The prognosis of the acute disease is very bad unless there is early operation. In chronic pancreatitis the immediate danger to life is not great but operation is imperative for cure.

The tail or body of the pancreas is the usual starting point of cysts. It is rarely possible to excise a cyst in its entirety. The usual operation must be incision and drainage with the risks of a subsequent fistula, often of long duration.

The Surgical Treatment of Amebiasis. WILLIAM SEAMAN, *New Orleans Medical and Surgical Journal*, August, 1911.

Operative treatment for the intestinal lesions of amebiasis is necessary because it is impossible to flush the ascending colon and the cecum per rectum. It is desirable to make a fistulous opening in the right abdomen for the purpose of efficiently flushing the large intestine. The operation of cecostomy is the operation of choice and it should not be made a last resort. The operation is simple and easily performed, and if a fistula only is established there should be no mortality. The operation of entero-enterostomy requires a high degree of surgical skill and has no advantage for the treatment of ulcers of the large intestine. For simple irrigation appendicostomy is preferable. For immediate irrigation in the acute fulminating or gangrenous type it is well to adopt Curl's method of picking up the cecum through a gridiron incision and anchoring it to the four corners of the wound caused by the decussation of the oblique muscles.

The advantages of appendicostomy are that there is less leakage of feces, and consequently skin irritation is minimized. This type of fistula closes more easily.

Stenosis due to the cicatricial contraction of the healing ulcers requires an abdominal section, a longitudinal incision over the constriction, the breaking up of adhesions, and if there is not too great an area of induration, stitching the bowels transversely. If the induration is extensive, a resection may be indicated.

Perforation is coincident with abscess formation and the surgical indications do not differ from those of a perforative appendicitis.

Spleen-Like Peritoneal Tumors Observed Six Years After Splenectomy for Rupture. (*Milzartige Bildungen un Peritoneum, Beobachtet Circa 6 Jahre Nach Einer Wegen Milzruptur Vorgenommenen Splenektomie*). R. FALTIN, Helsingfors. *Deutsche Zeitschrift für Chirurgie*, Vol. 110, Parts 1-3.

A 16 year old boy had been operated upon by the author for traumatic rupture of the spleen six years before. The organ was totally removed. The operation was not followed by any untoward symptoms for five years. (Several blood examinations that were made revealed a normal condition). The patient then began to complain of cramps in the right iliac region and lost some flesh and strength. A laparotomy was performed with a tentative diagnosis of appendicitis. At operation the entire visceral peritoneum was studded with pea to bean-sized, brownish-red, senile and pedunculated masses. They were smooth, covered by normal peritoneum and for the most part ambilicated. Upon microscopical examination these masses were found to very closely resemble the spleen in their structure. The author believes that these masses have resulted from an effort on the part of the peritoneum to compensate for the absence of the spleen; from a phylogenetic study Faltin concludes that the entire visceral peritoneum at one time functionated as the spleen.

Serum Treatment of Hemorrhagic Diseases. W. L. MASS and J. GELIEN, Baltimore. *Johns Hopkins Medical Bulletin*, July 1, 1911.

Subcutaneous Injection of Normal Human Blood Serum to Prevent and Overcome Post-Operative Hemorrhage in Patients with Chronic Jaundice. WILLY MEYER, New York. *Surgery, Gynecology and Obstetrics*, August, 1911.

Mass and Gelien report five cases of hemorrhage in which the injection of serum proved apparently beneficial. Three of these cases were intestinal hemorrhage from typhoid fever. In one case defibrinated human blood was injected intravenously; in the other two, fresh habbit serum; in one case, intravenously, in the other, subcutaneously. In all three cases the hemorrhage ceased soon after the injection. The other three cases were: 1. Intestinal hemorrhage in chronic nephritis. 2. Gastric hemorrhage in liver cirrhosis. 3. Secondary hemorrhage in the wound following cholesystatomy for chronic pancreatistis. In all these cases fresh rabbit serum was employed, in the first two subcutaneously, in the last intravenously. The result was striking in the last case, the hemorrhage ceasing promptly after the injection. The authors regard this method of treatment favorably.

Based upon the successful use by John E. Welch of human blood serum in the treatment of hemophilia neonatorum, Willy Meyer used human serum, with Welch's technique as a successful preoperative prophylactic against hemorrhage in four cases of chronic jaundice (all due to cancer of biliary tract or pencrease). He also used it with like success in two adult bleeders—in one to stop bleeding, in the other before extirpating a sarcoma.

Complete Substitution of the Esophagus. (VOLLSTANDIGER *Ersatz der Wochenschrift*, July 18, 1911. *ener Medizinische Wochenschrift*, July 18, 1911.

Roux in 1907 described an operation for stenosis of the esophagus. He resected a portion of the jejunum keeping its blood supply intact, and anastomosed the lower end into the lesser curvature of the stomach, drawing the intestine through the undermined skin of the chest wall and fastening its upper end at the level of the sternum. Numerous attempts to repeat this operation, by other surgeons, failed because the mobilized intestine became gangrenous. Herzen alone succeeded in doing a similar operation and furthermore completed the plastic repair by anastomasing the cervical portion of the esophagus with the subcutaneous thoracic loop.

Lexer several times constructed a subcutaneous substitute for a thoracic esophagus by forming a long skin flap which he rolled into a tube and covered in by drawing the remaining skin of the anterior thoracic wall over it. Where this new formed tube was anastomosed to the stomach, however, fistulae regularly developed. To overcome this difficulty he now combines Roux's and his own method. A short segment of intestine is connected with the stomach, and the remainder of the new esophagus is constructed of skin. The junction of skin tube and intestine heals without fistulae. Lexer has now succeeded in one case, a young girl whose entire esaphagus was firmly strictured by swallowing acid, in reestablishing communication between mouth and stomach.

The method is not infrequently needed, as stenoses after lye or acid burns are not very uncommon.

Lingual, Sublingual and Other Forms of Aberrant Thyroids. C. H. MAYO, Rochester, *Journal of the American Medical Association*, September 2, 1911.

Mayo describes the development of the thyroid, showing how accessory thyroid bodies can be produced. Anomalies of the lower portion of the gland are fairly common. Lateral aberrant thyroids are much less frequent while small accessory and aberrant thyroids between the hyoid and isthmus of the thyroid are relatively common. Mayo has seen but three lingual thyroids, one of them showing both types of lingual and sublingual. It is interesting, he says, to note in corroboration of the view that the bulk if not all of the thyroid has developed from the pharyngeal *anlage*, that in approximately one in seven of the patients operated on for lingual thyroids develop myxedema. Some cases probably were reported too soon after operation to give accurate information as to this point and in others only the cystic portion had been removed, leaving still a remnant of active thyroid. Mayo thinks that a very careful examination of the thyroid region should be made before operating on lingual thyroid so that a less extensive removal can be made if there is no palpable thyroid. It is very probable that stray portions of the thyroid are of frequent occurrence and unrecognized for the lack of pathologic symptoms. In the diagnosis the suprahyoid or midline tumors must be differentiated from malignant disease of the glands of undiscoverable primary origin, from thyroglossal duct cysts, from dermoids, ranula, lingual tonsils, etc. In some cases this will be determined only by operation. Free hemorrhage has been noted as a symptom. The slowness of the growth considering the richness of the blood-supply usually excludes malignancy. Angiomas are differentiated by being more spongy, irregular in outline,

of purple color and usually showing greenish extensions to lateral pharyngeal areas. "In the enucleation of lingual thyroids the tongue and pharyngeal areas are cocainized, the patient anesthetized with ether and a rapid operation made while the tongue is held in extreme tension. The free hemorrhage is controlled by deep sutures. In very extensive superior lingual goiter it may occasionally be advisable to ligate the lingual arteries and make a laryngotomy as a preliminary procedure. It will rarely be necessary to divide and separate the lower jaw. While the operations for the removal of lingual thyroids through the mouth have been quite bloody, they have been successful; practically no fatalities have been reported. Although there have been approximately but 50 cases recorded, undoubtedly there have been many others in which patients have been operated on."

Interlobar Exudates. A. K. STONE, Boston. *Boston Medical and Surgical Journal*, July 27, 1911.

Stone discusses the anatomical and clinical aspects of ecudates encapsulated between the pulmonary lobes. If one remembers the anatomical landmarks of the interlobor sulci the physical signs will naturally occur to him. Frequently, however, the signs similate closely those of a free ecudate, and suspicion is aroused only when aspiration at the usual site fails to reveal fluid. In such instances, aspiration high up in the axillary region, a little below the normal position of the sulcus will usually reveal pus. The same region is at the same time the site of election for operation.

Intratracheal Insufflation. S. J. MELTZER, New York, *Journal of the American Medical Association*, August 12, 1911.

Meltzer describes the essentials of a method of intratracheal insufflation, as consisting (1) in the introduction deep into the trachea of a flexible elastic tube, the diameter of which has to be much smaller than the lumen of the trachea, and (2) the driving through this tube of a nearly continuous stream of air which returns through the space between the tube and the walls of the trachea. Bringing the pure air directly to the larger bronchi and driving the vitiated air out through the force of the returning air-stream, that part of the death space is eliminated which is represented by the mouth, pharynx, larynx and trachea, and the practically continuous recurrent air-stream prevents the invasion of indifferent or infectious foreign matter from the pharynx into the trachea. The method keeps up an efficient respiration, overcomes efficiently and conveniently the difficulties presented by double pneumothorax and offers a safe and reliable method for anesthesia, especially by ether. Numerous experiments have been carried out by himself, Auer, Githens and Lamar showing the innocuousness of the method. Some surgical writers see in it nothing more than a modification of the Brauer or the over-pressure method, but this is a misunderstanding. The methods of over-pressure and under-pressure keep the lungs distended but do not ventilate, and the difference, in Meltzer's opinion, is that in the Brauer method the respiratory process is frequently deprived of nearly all its factors of safety, while in the intratracheal insufflation, the capacity for gas exchange of the respiratory apparatus is many times more extensive than is needed for the immediate maintenance of life, but this advantage is often lost under differential pressure by other methods. In surgical operations when these safety factors are placed at their minimum any small accident may be fatal. Hence the advantage of the insufflation method. In his former article on the subject, Meltzer claimed the advantages of the method in producing ether anesthesia and he repeats and amplifies his arguments on this point. He insists on the use of an open-ended tube instead of the catheter with the opening on the side. It also ought to be the rule that the continuous air-stream should be interrupted for a second or two five or six times a minute. These interruptions help in recognizing the degree of distention of the thorax. In conclusion he quotes from reports on the use of the method in human beings by Elsberg and Peck, both of whom point out its value and safety.

A Simple Method of Completely Removing Serous or Purulent Pleural Exudates. (*Eine einfache Methode seröse oder citrige Pleuralexsudate vollständig zu entleeren*). H. C. JACOBAEUS, Stockholm. *Muenchener Medizinische Wochenschrift*, August 29, 1911.

Replacement of exudates by means of filtered air has gained in popularity. The author has successfully used the following method in ten cases: He anesthetizes the skin, muscle and intercostal nerves with ½ per cent. novocain. He then incises the skin and introduces a large trocar (one which will admit the No. 12 straight Nitze cystoscope). The trocar is introduced at or above the ninth interspace so as to lessen the danger of injury to the diaphragm. After all the fluid which runs out is evacuated he introduces a uretercatheter, whose end is weighted with lead. The tip of the instrument, with the patient in the erect posture, sinks to the lowest part of the pleural cavity and by means of aspiration the last drop of fluid can be evacuated. The cystoscope introduced through the trocar permits of direct inspection. In 10 cases of acute pleuritis Jacobaeus has noted tubercles on the pleura in five. It is too early as yet to state whether complete emptying has a decided curative effect on tuberculous pleurisy or empyema.

A New and Simple Method of Removing a Renal Calculus. HOWARD A. KELLY, *Journal American Medical Association*, July 1, 1911.

Kelly says that a variety of methods should be at command in removing renal calculi. We have to vary our procedure according as the kidney is fixed or movable, the shape or size of the stone, the length of the lower rib and the stoutness of the patient, etc. A nephrolithotomy if well done is a comparatively safe procedure; otherwise it may be fatal. Kelly gives a method devised by himself, which, he says, except in the simplest cases with an easy exposure, is, as he believes, quicker and safer and better than pyelotomy or any other transrenal operation. The technic is described as follows: "A renal catheter 1.75 mm. in diameter, large enough to obturate the ureteral orifice and prevent a reflux of fluid into the bladder, is inserted through an open-air cystoscope and introduced well up to the kidney just before giving the anesthesia. The patient is then put to sleep, preferably with gas, semiprone, on an Edebohls cushion. An incision is made in the loin and the superior lumbar triangle is pulled open and the kidney exposed and freed on all sides from its fatty capsule. The stone is then felt and the kidney gently loosened as far as possible on all sides and brought toward the wound. Then an assistant forces fluid (1/1,200 silver nitrate) into the renal pelvis, until it puffs out tense. As a rule, with a careful preliminary study, the exact capacity of the renal pelvis is already known. When the pelvis and kidney are swollen up tense the surgeon first incises the capsule and then plunges a blunt-pointed, blunt-edged knife through the cortex in the middle of a pyramid somewhat on the posterior surface, easily entering the renal at once and enlarging the incision, in a transverse direction if the stones are small. There is a gush of fluid which stops as he introduces his finger and feels for and finds the stones, which he at once grasps with a small stone forceps and removes. The calices and the mouth of the ureter are now examined for more stones and the kidney is palpated on all sides with both hands, one finger being inside the renal pelvis. After all stones are removed the wound is plugged or held closed, while the pelvis and the calices are again distended with the silver solution, when the finger is suddenly withdrawn, letting the fluid escape with a rush, bringing any small calculus debris with it. This may be repeated several times." He emphasizes the following advantages which he thinks this method possesses: "1. It involves a minimal amount of damage to the kidney. 2. It is done through the part of the organ most easily accessible. 3. The distention is invaluable in offering a bag of fluid, overlain with a zone of soft tissue, which is easily punctured. 4. An exploration is easily conducted through the opening, revealing the presence or absence of other calculi. 5. If it is desirable to keep it open awhile for drainage the transverse incision is a good one for this purpose, as it can be left open and will close rapidly when the irrigations are omitted. 6. In the last case in which operation was done no sutures were put into the kidney,

and yet there was no escape of urine after twenty-four hours and practically no bleeding through the incision."

The Present State of Our Knowledge of Acute Renal Infections. GEORGE E. BREWER, New York. *Journal American Medical Association*, July 15, 1911.

Brewer discusses the infections of the kidney and says there are five routes of infection generally conceded as possible: 1. By direct penetrating wounds. 2. By direct extension from a neighboring focus. 3. By catheterization of the ureter. 4. By an ascending process from the lower urinary passages, and 5, by the blood-current. The first and third of these are unquestioned. The second is so rare as to be a surgical curiosity. He, therefore, takes up the fourth and fifth and gives a history of the investigations and their results in regard to the possibility of ascending infection and reports his own experimental studies. From a review of the known pathologic evidence, the experimental investigations of others, his own researches and clinical experience, he thinks we are justified in saying that: "1. An ascending infection is responsible for a certain proportion of the acute surgical infections of the kidney. 2. In the great majority of such instances, the infectious material is carried upward to the kidney by a reflux of contaminated urine into the ureter and renal pelvis through the ureteral orifice, as the result of some interference with its protective mechanism. The factors which favor this process are, in the order of their importance: (a) A chronic obstruction to the normal bladder outflow, a urethral stricture, obstructive prostatic hypertrophy, prostatic or vesical new growth; (b) acute cystitis with severe tenesmus and violent expulsive efforts; (c) severe inflammation, ulceration, calculus or new growth involving the ureteric orifices, interfering with the normal sphincteric action; (d) ureteral and detrusor paralysis from spinal injury or disease; and (e) the possible temporary paresis of the ureteric sphincter by the passage of a large ureteral calculus. 3. In certain rare instances the process may occur by a direct extension of the inflammation along the mucous membrane of the ureter by continuity of tissue, as proved by numerous clinical observations, although I have been unable to reproduce it in animal experiments. 4. In other rare instances the infection may ascend by the ureteral or peri-ureteral lymphatics, and this is more likely to occur if there exists an infection in the deep structures of the bladder-wall involving the vesical lymphatics. 5. As stated by Legueu, these methods in certain cases may be combined and concomitant." Next, taking up the subject of hematogenous infection, he reviews the investigations of others and gives details of his own experiments on rabbits and dogs by injecting cultures of various pathogenic bacteria into the veins. He concludes from all the evidence obtained by himself and others and the accumulated clinical experience, that, during the progress of any acute infectious disease, a certain number of microorganisms find their way into the blood-current and that many of these are excreted through the kidneys. If the number of these organisms is comparatively small there may be no demonstrable injury, but if the number if large and they are highly virulent or if one or both kidneys are diseased, overwhelming or fatal toxemia may follow or any of the pascal types of renal infection suppuration. While the trouble may be bilateral it is often unilateral on account of a diminished resistance of the infected kidney from disease or trauma. While he has been able to produce these lesions in animals by the *B. Coli*, the *Streptococcus pyogenes*, the *Staphylococcus aureus*, the *B. typhosus*, as well as the pneumococcus and *B. pyocyaneus*, in clinical cases he has been able to isolate only the first four of these. In some of his clinical cases, however, notably one of scarlet fever, search for bacteria proved negative. He has also been struck in his study of the subject by the great difficulty in producing ascending nephritis in animals as compared with the ease with which the hematogenous infection is produced. This would seem to corroborate the impression produced by clinical experience that hematogenous infection is responsible for most cases of renal sepsis, even when septic condition of the lower urinary passages also exists.

Hydrocele and Its Radical Cure by the Insertion of Catgut. C. H. WHITNEY, Boston, *Boston Medical and Surgical Journal*, August 10, 1911.

Whitney reviews the anatomy and clinical aspects of hydrocele thoroughly. Excluding the open radical method for the cure of hydrocele, he believes that the insertion of catgut, as recommended by Van Schaick, is the best. This consists in the insertion of about eight to sixteen inches of sterile catgut into the sac through the canula while the sac is being emptied. Soon after the operation, the sac begins to refill and is red and tender. The pain is moderate and does not require opiates. In 96 hours the swelling begins to absorb and a period of four to six weeks is required for complete absorption. Of 118 cases operated upon by this method, there were nine recurrences. Ten could not be followed. A case was regarded as cured if there was no recurrence after six months. Whitney also reports his results after the injection of pure carbolic acid. Of 61 cases, there were eight recurrences, while 12 patients were lost sight of. The author regards the injection of iodine as less satisfactory.

Some Methods of Physical Examination in the Diagnosis of Surgical Diseases of the Kidney. HAROLD NEUHOF, New York. *Medical Record*, July 15, 1911.

Neuhof emphasizes the value of a few methods, not generally employed, in the diagnosis of ambulatory renal affections. 1. Inspection. "When one kidney is the subject of an acute infection, the corresponding lumbar and abdominal regions remain almost or quite immobile." "If the patient be placed on his back in a light so cast that the lateral chest and abdominal walls are in shadow—in such affections as acute pyrlonephritis, for instance—the shadow overlying the lateral abdominal region moves with respiration on the normal side, but remains immobile on the diseased side." 2. Cutaneous hyperalgesia. Neuhof reaffirms the value of the head zone. 3. Muscular spasm and rigidity. Spasm of the quadralus muscle is of special significance. In connection with clinical history, this sign is almost pathagnomonic of surgical renal disease. 4. Lumber tenderness. Neuhof calls attention to a small area of tenderness, overlying the lowest two or three ribs at the margin or overlapping the erector spinal muscle. 5. Movements of the trunk. Hyperextension or hyperflexion of the spine will cause pain on the affected side. 6. Percussion of the kidney. The author has not found this sign of great value. It affords only approximate results in connection with inflation of the colon. In this particular it is of value to diagnose presence or absence of the kidney.

The Treatment of Subacromial Bursitis. J. TORRANCE RUGH, *The Pennsylvania Medical Journal*, August, 1911

While this condition is curable, the treatment must cover an extended period of time. The *X*-ray should be carefully and frequently used in order to learn the true condition of the bursa.

In the acute form the essential of treatment is rest. The patient may be placed in bed and the arm put in marked abduction to separate the inflamed surfaces, to lessen pain, and to prevent adhesions. Relief may be gotten by seating the patient at the side of a table and placing the arm in abduction on pillows or cushions arranged on the table. A generous blister over the site of the bursa is often advantageous. Hot or cold applications will assist in relieving pain.

When the acute symptoms begin to subside, passive motions are indicated to break up the beginning adhesions in the bursa. Though painful, these movements must be persisted in, the arm being put to rest as soon as each set of manipulations is completed. These movements are performed in all the directions of the normal shoulder joint functions but external rotation and abduction are especially indicated. As soon as the pain of movement can be tolerated the patient should be encouraged to attempt the movement himself. The arm must not be carried continually in the sling position, as posture adhesions are likely to occur. Recovery may be expected in from four to eight weeks.

Frequently external rotation may be limited by adhesions. The indications are then to break up the

bands and restore a normal function to the altered bursa. Under ether careful but forcible manipulation in the direction of limited motion may be successful, but too great force must not be used lest a severe inflammation ensue. A little gain at each séance is all that may be expected. Manipulation must be continued until the desired range of motion has been secured. During the manipulations it is essential that an assistant grasp the scapula firmly so as to prevent its motion masking the true motion of the humerus. When the fixation of the joint does not yield to moderate efforts it is safer to incise the bursa and to separate the adhesions with a knife, scissors or the fingers. To separate the adhesions more widely the arm must be rotated inward and then, after fixing the scapula, raised high above the shoulder level. Free gymnastic exercises are indicated, unrestricted use, and avoidance of the position close to the side.

If, in the acute stage, the bursa is greatly distended and can be palpated under the deltoid muscle, it may be punctured, tapped or freely opened to get rid of the fluid. If there is much grating over the head of the humerus on manipulating, or if manipulation continues painful after four to six weeks' treatment, the bursa should be opened and the adhesions cut out as far as possible. When the walls of the bursa are greatly thickened, or if it contains rice-bodies or any diseased material, the indications are for removal and destruction of the sac. The after-treatment is important for the arm must not be allowed to hang at the side. The arm should be held elevated to the shoulder level by a wire splint, plaster of Paris or by posture when the patient is lying in bed. The same procedure must be employed as after the acute attack gradual use of movements and exercises so as to establish a full range of motion at an early date.

Early Operation for Psoas Abscess and the Treatment of Hip-joint Disease. JAMES K. YOUNG, *Medical Council*, August, 1911.

Young does not look with favor upon the old methods of delay until the disease has advanced into the pelvic cavity and then using drainage in the loin and groin. He makes an incision parallel with the posterior superior spine and about 2½ inches to either side for the division of the skin and superficial fascia. The sheath of the erector spinæ muscle is divided and then the quadratus lumborum. The third lumbar is located and the attachment of the psoas muscle to this is separated. A blunt instrument is introduced into the psoas muscle and the abscess is drained. Boric acid solution is used for washing out. Drainage is maintained for only a short time. The indications for the operation are contraction of the psoas muscle, tender point over the transverse process of the third lumbar vertebra and leucocytosis.

For the treatment of hip joint disease Young describes a special splint to maintain traction and fixation.

Abdominal Pain from Antero-Posterior Curvature. MARK H. ROGERS, Boston. *Boston Medical and Surgical Journal*, August 3, 1911.

Rogers reports two cases. In the first, a constant pain in the right lumbar region radiating to the inguinal canal led to the suspicion of renal stone. X-rays, however, revealed none. The author found a faulty position of the body in the erect position with a compensatory lumbar lardosis. The second patient complained of pain in the appendix region. The same ankero-posterior curvature was noted. In both patients correction of the deformity by braces relieved the suffering.

The Mobilization of Stiffened Joints. R. B. OSGOOD, Boston. *Boston Medical Journal*, July 20, 1911.

Osgood reports three cases in which the interposition of Baer's membrane proved very successful. The first was one of ankylosis of the jaw, the second, of the knee, and the third, of the elbow. Baer's membrane is obtained from the bladder of a pig and is chromicized like catgut. It is not absorbed for at least 30 days. (In one of the author's cases it was not absorbed for 11 weeks.) Its purpose is to prevent bony union between the divided ends of the bones.

Blue Sclerotics and Brittle Bones. HAROLD BURROWS, Portsmouth. *British Medical Journal*, July 1, 1911.

Eddawes first noted this association in three cases in 1900. Burrows makes a highly interesting contribution to this subject. He gives the geneological tree of a family in whom blue scleratics and multiple fractures were common. In the first place, it was noted that blue scleratics were inherited only from parents in one or the other of whom blue scleratics were present. In the second place, of 13 individuals who had blue scleratics nine gave a history of having had fractures; in seven, these were multiple. In the third place, in not a single member of the family in which the scleratics were normal, was there a history of fracture. Eddowes ascribed the cause of this peculiar association to the fact that blue scleratics, as Buchanan had shown, indicate a deficiency of fibruous tissue in the cornea. This suggests that there is probably a congenital deficiency in the supporting framework of the bones.

A Further Note on the Clinical Use of Scarlet Red and Its Component Amidoazotolnol, in Stimulating the Epitheliation of Granulation Surfaces. J. S. DAVIS, *Johns Hopkins Medical Bulletin*, July, 1911.

The beneficial effects of scarlet red ointment (8%) on sluggish and extensive granulating areas were reported by Davis two years ago. His further experiences confirm his good opinion of the efficacy of this remedy. Recently he has tried the effect of amidoazotoluol ointment (8%) as recommended by Hayward and finds this ointment equally, if not more, effective. The dressing with either of these ointments is simple, non-irritating, and causes less discomfort than other forms of dressing. The use of scarlet red or amidoazotolnol in blue ointment is advantageous for syphilitic ulcers. Davis has never seen a wound healed with these ointments break down. At times it is advantageous to apply either ointment directly to the wound and then expose to sunlight and air. The substances can be used as a dusting powder in four to eight per cent. strength to boric acid. The method of application briefly is as follows: The ointment is applied alternately with some bland ointment every 24 or 48 hours. Anoint the skin surrounding the defect with some bland ointment to within 1 cm. of the edge; then spread the scarlet red ointment in a thin layer on perforated old linen and apply to the wound. If a 4 per cent. scarlet red ointment is applied on partial skin grafts 48 hours after grafting, there is rapid stimulation of the wound edges and also of the grafts themselves.

The Advantages of the So-called Decortication of the Lung in Old Empyema. F. B. LUND, Boston, *Journal of the American Medical Association*, August 26, 1911.

Lund discusses the various methods of treating old empyema with contraction of the lungs, and favors the De Lorme-Fowler method of excising the thick inelastic membrane or cicatricial tissue which covers the lung and binds it down in cases of old empyema. The real credit of devising the operation, he thinks, should be given to De Lorme, though both published it about the same time. He does not think that Ransohoff's recommendation of making multiple incisions in the thickened pleura can possibly be as efficient as the free removal of the thickened membrane which has proved successful in his own hands. He reports seven cases, four of them in which this operation was performed at first, and in three an attempt was made to relieve by Thiersch's method. In one of the three a second operation for decortication was done with good results. In the other two it was performed, but unsuccessfully, the patients dying, one of septicemia and the other of pneumonia. The technic of the operation is described in detail. He has not had an opportunity to employ either positive or negative pressure as an aid in these operations, and does not believe it is necessary if ether is withdrawn as soon as possible and the patient allowed to cough at the moment the membrane has been stripped off the lung. This facilitates expansion wonderfully. The intratracheal insufflation method of Meltzer and Auer will, he thinks, be useful in these cases, and it has been employed by his colleague, Nichols, in one case of decortication with remarkably good results.